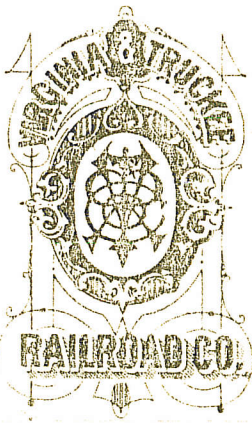


Virginia & Truckee #12

GENOA - STEAM LOCOMOTIVE

Restoration Feasibility Report
Preliminary Report
Restoration Options
Research and Restoration Report





STEPHEN E. DREW

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CALIFORNIA STATE RAILROAD MUSEUM,

Old Sacramento:

EQUIPMENT RESTORATION FEASIBILITY INVESTIGATION

Compiled by

STEPHEN E. DREW

WILLIAM A. ODEN

For the

STATE OF CALIFORNIA

DEPARTMENT OF PARKS AND RECREATION

1976

Summary
Chronology

- I. Historical Prespective
Specifications
- II. Current Condition Evaluation
Component Analysis
- III. Restoration Recommendations

Virginia & Truckee Railroad Locomotive No. 12 "Genoa"

Virginia & Truckee Railroad Locomotive No. 13 "Empire"

Virginia & Truckee Railroad Locomotive No. 21
"J. W. Bowker"

Northwestern Pacific Railroad Locomotive No. 112

Virginia & Truckee Railroad Combination Car No. 16

Sierra Railway Company of California Passenger Car
No. 3 "Stanislaus"

Central of Georgia Railway Business Car No. 97
"The Gold Coast"



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September 15, 1976

Mr. Norman L. Wilson
Supervisor, Interpretive Planning
Department of Parks & Recreation
P. O. Box 2390
Sacramento, California 95811

Dear Mr. Wilson:

Herewith is our second preliminary report containing historical sketches, current condition analyses and restoration recommendations covering Virginia & Truckee Locomotives No. 12 "Genoa" and No. 21 "J. W. Bowker", Northwestern Pacific Locomotive No. 112 and the Central of Georgia Private Car No. 97 "The Gold Coast".

We have again taken the liberty of sharing these preliminary findings with officers and directors of the Railway & Locomotive Historical Society, Pacific Coast Chapter. Following 30 days review, we will print the final corrected illustrated report covering the seven pieces together with a summary history of the project, the Pacific Coast Chapter, appropriate credits and acknowledgements and an equipment update.

Once again we appreciate the privilege of furnishing this report and look forward to discussing it with you.

Yours very truly,

Stephen E. Drew
Stephen E. Drew

William A. Oden
William A. Oden

/bk

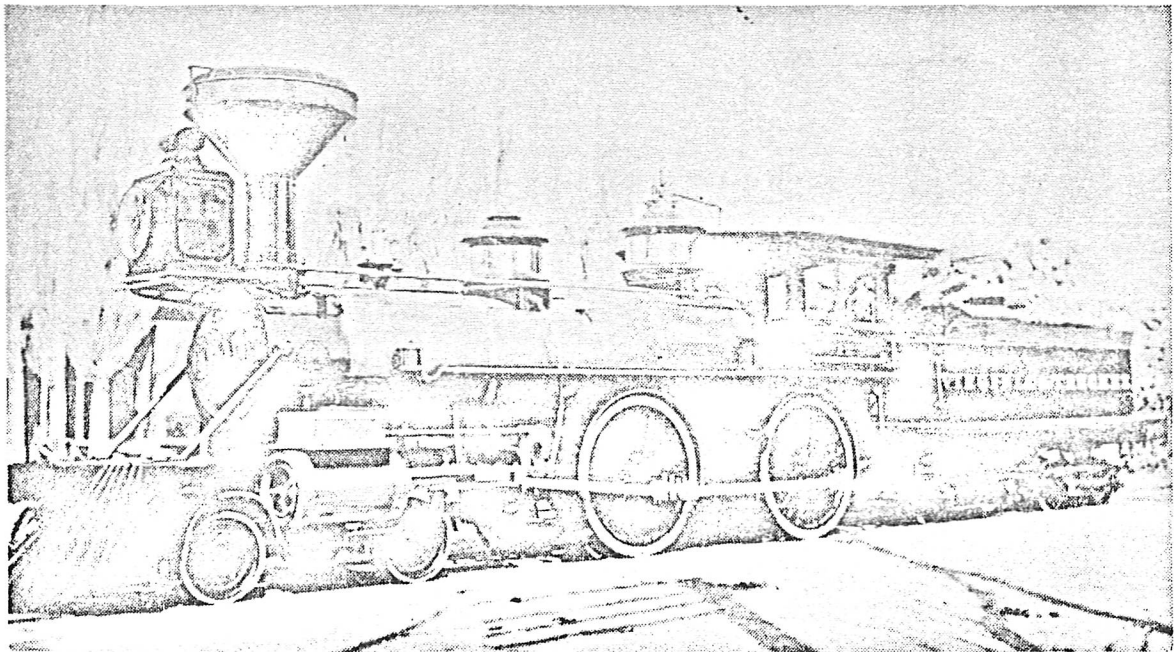
INTERPRETIVE PLANNING UNIT
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Department of Parks & Recreation
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Sacramento, California 95814

VIRGINIA & TRUCKEE RAILROAD COMPANY

LOCOMOTIVE NO. 12 "GENOA"

- I. Historical Perspective
- II. Current Condition Evaluation
- III. Restoration Recommendations

11/89
PRELIMINARY
SUBJECT TO REVISION



Carson City, Nevada, ca. 1902

VIRGINIA & TRUCKEE RAILROAD

LOCOMOTIVE NO. 12 "GENOA"

Summary

History: Virginia & Truckee Locomotive No. 12 "Genoa" was built in 1873 by the Baldwin Locomotive Works of Philadelphia, Pennsylvania, at a cost of \$14,000. The engine was used for nearly 40 years to haul passenger trains and occasionally light freight cars. A decline in railroad revenue forced the temporary retirement of the engine from 1908 until it was sold in 1938 for operation at the New York World's Fair. The engine was last operated in 1957. The locomotive was donated in 1940 to the Railway & Locomotive Historical Society and was conditionally presented by the Society's Pacific Coast Chapter to the State of California in 1969. It is presently on semi-restored display in the reconstructed Central Pacific Railroad Passenger Depot at Old Sacramento, California.

Condition: In 1969, the locomotive received major display restoration at the Southern Pacific Sacramento General Shops. The engine was repainted to resemble Central Pacific Railroad Locomotive No. 60 "Jupiter" and its appearance has not been altered since that time. The locomotive has received many modifications in its lifetime and its present mechanical condition most closely approximates its 1902-08 appearance on the Virginia & Truckee Railroad.

Restoration: The engine requires minor cleaning, straightening, tightening, repainting and polishing for appropriate public display. For optimum quality restoration, the locomotive should be returned to a pre-1900 mechanical appearance as the Virginia & Truckee "Genoa". The engine has far greater historical significance lettered V. & T. No. 12 than as one of several engines in the country inaccurately impersonating the C. P. "Jupiter". The Virginia & Truckee "Genoa" is an early classic among American-style steam engines and the full restoration of its resplendent original 1873 appearance will culminate in a unique, eye-catching, colorful, multi-faceted and historically accurate locomotive for wide public viewing.

Stephen E. Drew
William A. Oden

July 1976

CHRONOLOGY

- 1873 Built by M. Baird & Company, Baldwin Locomotive Works, Philadelphia, Pennsylvania, for \$14,000 as Virginia & Truckee Railroad Locomotive No. 12 "Genoa"
- 1874 First V. & T. engine equipped with Westinghouse Air Brakes
- 1900 Rented to Sierra Nevada Wood & Lumber Company and Boca & Loyalton Railroad
- 1902 Rebuilt: Tower automatic couplers, safety appliances and sunflower stack
- 1908 Retired, stored Carson City Enginehouse
- 1938 Sold to Eastern Railroads Presidents' Conference for \$1,275
- 1939 Left V. & T., operated at New York World's Fair
- 1940 Presented to Railway & Locomotive Historical Society, Inc.
- 1948 Operated at Chicago Railroad Fair
- 1949 Operated for San Jose-Oakland Excursion
Operated for Western Pacific R. R. Ruby Jubilee, Keddie, California
- 1953 Operated for National Model Railroad Association Convention Excursion, Reno, Nevada
- 1955 Displayed Southern Pacific R. R. Centennial, Sacramento
Publicity excursion Oakland-Niles for United Crusade
- 1957 Operated for Arthur Godfrey TV Show, San Francisco
- 1964 Ownership transferred to Pacific Coast Chapter, R&LHS, Inc.
- 1969 Displayed at National Golden Spike Historic Monument, Promontory, Utah
Presented conditionally to State of California
Stored Safeway Stores Distribution Warehouse, Sacramento
- 1976 Placed on semi-restored display at Old Sacramento

I. HISTORICAL PERSPECTIVE

1873 - 1938

Virginia & Truckee Railroad Locomotive No. 12 "Genoa" is a classic example of the conventional 4-4-0 American-style steam engine which for nearly three decades was the standard locomotive of the railroad world. By 1870, over half of the locomotives in existence in the United States were of this one type. The designation "American" or "4-4-0" refers to the Whyte locomotive classification chart which indicates a steam engine having eight wheels comprising a non-powered four wheel lead truck, four powered drivers and no trailing truck. The 4-4-0 wheel arrangement was designed for maximum traction, power and speed and the light weight and compact nature of the engine rendered it extremely flexible for all types of track condition and train operation. The American 4-4-0 rapidly became the symbol of the progress and the industrial strength of the United States to the outside world of the Nineteenth Century. Some 25,000 of the locomotives were constructed and operated between 1837 and 1885 alone yet only a small number of these engines remain in existence today.

Constructed during 1872-1873, the "Genoa" represents the classic advanced state of the art of American-type steam locomotive construction in its heyday. By 1873, the 4-4-0 had advanced to a mature design with calculated proportions, improved details, a graceful appearance and an elegance and effectiveness that were to last unchanged for nearly a quarter of a century.

The Virginia & Truckee Railroad used the American-type primarily for hauling priority scheduled through passenger trains over the 52.20 mile main line connecting Reno and Virginia City, Nevada. During the lifetime of the Virginia & Truckee (V. & T.) from 1868 to 1950, the railroad owned 29 steam locomotives--six of which were passenger hauling 4-4-0's. Upon the completion of the Reno to Virginia City line in August 1872, the V. & T. owned only one 4-4-0, No. 11, which it pressed into service pulling wooden passenger coaches. Named the "Reno", Locomotive No. 11 was completed in May 1872 by the Baldwin Locomotive Works of Philadelphia, Pennsylvania, at a cost of \$12,250.00. The late 1872 connection of the V. & T. with the overland Central Pacific Railroad at Reno brought with it a dramatic increase in passenger traffic which the Locomotive "Reno" was unable to handle alone.

Anticipating the sizeable increase in passenger business, V. & T. General Superintendent Henry M. Yerington wisely ordered another 4-4-0 from M. Baird & Company's Baldwin Locomotive Works on

July 26, 1872. Ordered as V. & T. Locomotive No. 12 "Sharon", the engine was to be identical to the "Reno" with minor improvements. The valued order was acknowledged by Baldwin in a letter dated August 2, 1872:

"We enter your order for a locomotive, the 'Sharon', No. 12, a duplicate of the 'Reno' except as to smoke-stack, which is to be a woodburning stack, like that on the 'Washoe' or Nevada'.

"We put the engine in the first vacant place in our list which is in February.

"Prices of locomotives of this class have advanced \$2000.00 since January last, owing to the enormous increase in the cost of iron and other material, but we enter your order at Fourteen Thousand Dollars (\$14000.00) including headlight, which we will try and remember to send with the engine."

The order of the wood burning locomotive was entered by Baldwin on August 5, 1872, as class 8-26 C 33, boiler No. 3090. Translated, the class designation 8-26 C 33 was Baldwin's methodical system which indicated "8" for a total of eight wheels under the engine, "26" indicating cylinders 16 inches in diameter, "C" designating four connected driving wheels and the number "33" revealed that the locomotive was the 33rd engine of these exact specifications ever built by Baldwin.

The practice of naming V. & T. engines began with the railroad's first locomotive which was christened the "Lyon" in 1869. The name was usually applied in raised brass letters on panels on both the engineer's and fireman's sides of the hard wood locomotive cab. The names of the early engines were all geographical place names from Nevada counties, cities, rivers and communities like "Storey", "Ormsby", "Carson", "Virginia", "Humboldt", "Washoe", "Comstock" and "Reno". Until 1872, the only exception to the geographical name rule was the V. & T.'s 2-4-0 switch engine No. 9 which was named in honor of acclaimed local surveyor Isaac E. James; James and his crew surveyed the route of the V. & T. and several predecessor roads. It was no doubt to honor the V. & T. Company's President and U. S. Senatorial aspirant William Sharon that Superintendent Yerington ordered the road's new passenger Locomotive No. 12 to be named "Sharon". The naming evidently did not meet with William Sharon's approval, however, for within six months of ordering the engine, Yerington wrote Messrs. M. Baird & Co. to make an alteration

as follows:

"For certain reasons I wish you would be good enough to change name of Locomotive 'Sharon' No. 12 to come out in February to 'Genoa' No. 12. I hope the making of this change of name will not put you to any inconvenience!"²

Baldwin changed the name on the official specification sheet from "Sharon" to "Genoa" effective December 30, 1872.

"Genoa" is the name of the oldest settlement in Nevada. Located approximately 15 miles southwest of Carson City in Douglas County, it was established in 1851 as the first permanent Nevada settlement and was named Genoa by Mormon Elder Orson Hyde of Salt Lake City after the birthplace of Christopher Columbus. Genoa (pronounced Ge-nō-a) was an important agricultural community of ultimately 1,000 residents on the 1860-61 route of the Pony Express. The first printed newspaper in Nevada, the Territorial Enterprise of Mark Twain fame, was founded at Genoa on December 18, 1858, and published its editions there until moving to Carson City and ultimately to Virginia City in 1860. Today Genoa is a picturesque town containing many interesting buildings, several businesses, occupied residences and a restored Mormon stockade.

The Locomotive "Genoa" was certified for shipment from the Baldwin Locomotive Works on January 7, 1873, and left Philadelphia late in January together with the V. & T.'s two new freight engines No. 13 "Empire" and No. 14 "Esmeralda". The "Genoa" arrived on the V. & T. at Reno early on the morning of Monday, February 17, 1873, and was immediately sent 11 miles south to the V. & T.'s Steamboat Springs Roundhouse where final preparations and tests were made prior to revenue service.

No. 12's first run up the hill from Carson to Virginia City occurred amidst light snow flurries on the evening of Wednesday, February 26, 1873. Late in the day around 4:00 p.m., several ore cars had derailed on the main line out on American Flat and most of the Carson-Virginia City trains were delayed over three hours as a consequence. But under the watchful care of V. & T. Conductor See, the "Genoa" headed east out of Carson City at 6:00 p.m. as train No. 17 with six loaded V. & T. flat cars and the following way bills:

Flat Car No. 61, wood to Gould & Curry, Virginia City
Flat Car No. 83, wood to Gould & Curry, Virginia City
Flat Car No. 69, wood to Sapphire, Gold Hill

Flat Car No. 114, wood to Sapphire, Gold Hill
Flat Car No. 45, wood to Silver Hill, Gold Hill
Flat Car No. 102, lumber to Caledonia, Gold Hill

The locomotive performed with efficiency and ease and a second trip was made the next morning. The only apparent trouble with the engine was its unexpectedly limited pony truck swing which played havoc with the V. & T.'s tight 18 and 19 degree curves. Yerington reluctantly concluded that the engine required compromising alterations by March 15, 1873, when he wrote the Baldwin Locomotive Works:

"How soon could you supply us with one Locomotive like the 'Esmeralda' and one like the 'Genoa' and what would be your figures?

"I regret to say that the iron gibs of the 'Empire' and 'Esmeralda' are cutting guides very badly and we are now putting in brass ones.

"We also find that the forward truck of the 'Genoa' has only about 2-1/2 inches swing (instead of 8 inches like the 'Reno') and she as a consequence jumped the track three times last week. I propose taking her into [the] shop at once and making the alterations necessary much against my will for we require her services very much indeed."

Following alterations to conform the engine to the successful operating specifications of the No. 11 "Reno", the "Genoa" worked flawlessly--so much so that Yerington ordered another Baldwin 4-4-0 identical to the "Genoa" later in March 1873. The order was cancelled two weeks later, however, when the Central Pacific Railroad agreed to sell the Virginia & Truckee two American-type locomotives and the V. & T.'s request for another Baldwin 4-4-0 was not revived until late in 1874 when the No. 22 "Inyo" was ordered.

The "Genoa" had 56-3/4 inch diameter cast iron drivers with specially turned all flanged steel tires which were tapered or coned 3/16ths of an inch over their 4 inch face to facilitate travel over the V. & T.'s sharp curves. The cylinders measured 16 x 24 inches and an operating boiler pressure of 130 lbs. per square inch provided 11,705 lbs. of tractive force. The rigid wheel base measured exactly 8 feet and the total engine only weight in running order was 65,000 lbs. The trailing 26 inch diameter eight wheeled wood frame tender held 2-1/2 to 3 cords of seasoned wood

fuel and 2,200 gallons of water for a loaded weight of 48,400 lbs.

The horizontal tube boiler contained 144 two inch copper ended tubes measuring 10 feet 10-3/8 inches in length. Planished Russian Iron covered the magnesia boiler lagging and iron bands covered with brass having formed edges sealed the jacket joints. The Russian Iron was toughened by light hammering and polishing and its natural unpainted blue lustre was well preserved by constant light oiling. The peaked roof cab was handcrafted from the finest clear black walnut and was decoratively painted and high gloss varnished. A huge ornamented headlamp was mounted in front of the boiler smoke box; the headlight contained a heavily-silvered parabolic reflector which, when highly polished, could throw a concentrated beam of light far out ahead from a well trimmed kerosene oil burning wick.

The colorfully painted passenger hauling engine contained a myriad of ornate brass fixtures and fittings which were the responsibility of the fireman to keep clean and brightly polished. Brass trim adorned the jacket bands, steam and sand dome casings, wheel fenders, cylinder covers, steam chest casings, boiler checks, hand rails and acorn ends, running board nosing, number and builder's plates, grab rails, wheel covers, gauges and whistle. Shop wipers working 10 hours a day, six and seven days a week at 25¢ an hour regularly cleaned and polished the serviceable V. & T. locomotives each day. Passenger-type locomotives like the "Genoa" were always brightly painted and received particular grooming attention for daily viewing by Superintendent Yerington and the traveling public. The pride and efficiency of operation of the V. & T. was admirably reflected in the immaculate condition in which the passenger carrying engines were maintained.

For nearly 30 years the "Genoa" was a regular passenger and occasional freight and mixed train hauler. The Baldwin Americans' "Reno", "Genoa" and "Inyo" formed the passenger locomotive pool which alternated primary responsibility on the two daily through express crack trains between Reno and Virginia City. With the inauguration of the joint Central Pacific-Virginia & Truckee Lightening Express beginning May 1, 1876, direct daily through passenger service connected Virginia City and San Francisco via the Vallejo boat. The Reno-Virginia City fare was \$3.00 and the trip usually took three hours with a brief stop over at Carson City. The morning train to Virginia City, Train No. 1, arrived at Virginia in sufficient time to transact a day's business while the returning San Francisco Express, Train No. 2, left Virginia in the early evening for the over night Silver Palace Sleeping Car return to Vallejo. The V. & T. section of the Lightening Express in the early years consisted of four wood frame coaches containing passengers, baggage, express and an operating railway post

office on wheels. The regularity and dependability of V. & T. Express Trains Nos. 1 and 2 and their distinctive 4-4-0 haulers were regarded by generations of Nevadans as institutions as predictable as the four seasons and as trusted as the daily rising and setting of the sun.

No. 12's first and only major accident likely occurred on October 31, 1874, while approaching Reno with the late evening passenger train from Virginia City. The Territorial Enterprise carries the following account of the incident:

"A SMASH-UP.--The passenger train of the Virginia and Truckee Railroad, which left here last Saturday night for Reno, met with quite a serious accident at a point about a mile south of the town named. The train was running at full speed when it struck two flat cars, which some villain unhung had turned loose on a side track and which had run down and stopped across the main track. The two flat cars were completely demolished and the engine and tender of the passenger train were badly used up. Thomas Clark, engineer, and John Webster, fireman, received a number of very painful cuts and bruises, but were not seriously injured. The cuts were from broken glass. The passengers were a good deal shaken up, but fortunately none of them were hurt. The front end of the express car was considerably shattered. The locomotive, the 'Genoa' has been sent to the shop in Carson for repairs." ⁴

While in the shop, No. 12 became the first of two V. & T. locomotives to be outfitted with Westinghouse driving wheel air brakes to augment manual tender brakes furnished by the builder. The job was completed on November 21, 1874, at a cost of \$750 for the locomotive and four passenger cars. Early V. & T. Engineers liked to operate the "Genoa" as it was believed to be the fastest of the railroad's 24 original steam locomotives. For this reason it saw considerable duty on special picnic, private and excursion trains. When required for freight service, the "Genoa" easily handled up to seven of the V. & T.'s loaded short wooden freight cars.

Between 1873 and 1908, No. 12 was in generally constant use unless under repair at the Carson City Shops; even during the Nevada depression years of the 1890's, the "Genoa" was one of the few locomotives consistently retained in service. A new 8 inch Westinghouse

air pump was installed in June 1892 for \$350 and the driving wheel brake assembly was brought up to U. S. Interstate Commerce Commission (I. C. C.) safety requirements in 1898 at a cost to the short line of \$156.88. The lengthy 21 foot 9 inch total wheel base of the engine and the bonanza line's numerous curves quickly wore out the 26 inch diameter forward engine truck and tender wheels and, as a result, the plate wheels were frequently replaced as often as every 4 to 5 years. During inclement weather, the iron bar pilot was covered with light sheet iron for use in removing several inches of snow from the tracks. Heavy snows mandated the use of a full engine snow plow and as many as four additional locomotives to get passenger, express and mail trains through the snow. For their part in operating the "Genoa", a typical four man crew running the locomotive in 1878 earned \$5.00 per day for the engineer, \$4.00 per day for the conductor, \$3.50 for the fireman and \$3.00 a day for the brakeman. The daily tour of duty was at least 10 hours and quite frequently for 7 days a week.

By 1880 the well-equipped Carson City Shop complex was handling the major repair and construction requirements of not only the Virginia & Truckee and affiliated Carson & Colorado Railroad but equipment for short line railroads throughout California and Nevada. In 1896, the V. & T. switch engine No. 21 "J. W. Bowker" was sold to the Sierra Nevada Wood & Lumber Company at Hobart, California, becoming S. N. W. & L. Co. Locomotive No. 3. In July 1900, the No. 3 was sent over to the Carson Shops for repairs and the V. & T. agreed to rent the "Genoa" to the Hobart line while the former "Bowker" was in the shop. From August 1 to September 9, 1900, the "Genoa" was rented by the S. N. W. & L. Co. for \$15.00 a day with a V. & T. crew comprising machinist Charles J. Rulison and engineer Charles Pohl.

When the new Boca & Loyalton Railroad was under construction at Boca, California, in the fall of 1900, the "Genoa" was again briefly rented for \$15.00 a day commencing at 7 a.m. November 9, 1900. No. 12 was returned to the V. & T. Shops on November 26th and the switch engine No. 9 "I. E. James" was sent over the following morning to take its place. This time the "Genoa" proved too heavy for the light weight lumber road under construction by the Boca & Loyalton and the flanges of the back driving wheels were worn severely sharp due to excessive use of the engine in operating backwards.

From October 1901-April 1902, the 12 spot was completely overhauled, rebuilt and modified in the Carson back shops at a total material and labor cost to the V. & T. of \$4,682.04. Two No. 7 Monitor injectors, new Midvale steel tires, tubes, grate bars, asbestos lagging,

Ashcroft steam gauge, Russian Iron jacket and 763 feet of wood including a new wood pilot were installed to update the engine for handling the resurgence of passenger traffic generated by increased mining activity in Southern Nevada. The "Genoa" was the V. & T.'s first engine to receive the I. C. C. approved Tower patent Janney-style automatic knuckle coupler and larger 9-1/2 inch Westinghouse Air Brake System during February of 1902. Prior to the application of Tower drawheads, the passenger 4-4-0 had been used only for connecting with link and pin couplers, Sam's patent draft gear and the Miller coupling hook. The Baldwin Yankee balloon smoke stack was also replaced with a sunflower stack fashioned in March 1902 from 225 lbs. of No. 14 iron together with a 97 lb. cast iron smoke stack ring, a 243 lb. cast iron stack saddle and 14 feet of spark wire netting.

In a vain effort to conceal the age of their locomotives for safety inspection and valuation purposes, the V. & T. had the 1873 date of construction removed from the two smoke box-mounted builder's plates. A new headlight was installed on November 28, 1903.

With the opening of the 15.28 mile V. & T. branch line from Carson City down to Minden, Nevada, in July 1906, the "Genoa" regularly alternated duty with the "Columbus" on the daily Carson-Minden mixed train. The engine was last overhauled at the Carson Shops in October of 1908 when air sanders and a cap stack were applied, the cab name panels were modified and the engine was completely repainted.

As passenger hauling requirements again declined, the "Reno" and 1875 "Inyo" were able to amply handle the greatly reduced volume of passenger traffic and the wood burning "Genoa" was no longer needed for revenue service by 1909. Therefore, effective December 31, 1908, the Baldwin American was retired to stall two of the Carson City Enginehouse. On June 25, 1912, No. 12 was steamed for the last time on the V. & T. as her steam gauge, stay bolts and safety pops were successfully tested by the I. C. C. Inspector to 165 lbs. boiler pressure. Between the time of her October 1908 overhaul and her retirement on December 31st, the engine operated only 3,246 miles and consequently she was still in prime condition for revenue service had V. & T. traffic been significant enough to warrant her continued operation.

While built at a cost to the Virginia & Truckee of \$14,000 plus \$1,250 freight charges, an estimated \$250 to set the engine up and \$417 on initial improvements, the "Genoa" carried an appraised V. & T. ledger value of only \$8,000.00 by 1910. Parts from the engine were occasionally appropriated to help keep the "Reno" and "Inyo" in service during the

1920's. Her I. C. C. depreciation allowance having expired, the "Genoa" was officially retired from the V. & T.'s equipment ledger accounts on April 30, 1937, with a final scrap value of \$400.00.

When the I. C. C.'s lowest permissible boiler safety stress factor on the first course seam was increased from 3-3/4 to 4 effective January 1, 1923, No. 12 came under violation and no longer could be legally operated without major renewals. For a short time the management of the V. & T. even contemplated purchasing a new boiler for the engine and converting the locomotive from wood fuel to oil burning apparatus; Baldwin estimated a new radial stayed boiler and fire box for No. 12 on May 17, 1917 at \$3,850.00 f.o.b. Philadelphia. But declining V. & T. revenues never justified the expenditure and the "Genoa" avoided reboiling, conversion to fuel oil and the addition of numerous contemporary federally required safety appliances. From 1908 until 1939, the locomotive sat unused in the Carson City Enginehouse.

1938 - 1976

"Railroads on Parade" was a pageant attended by over two million spectators at the 1939-40 New York World's Fair. Technical director for the pageant and then chairman of the Pacific Coast Chapter of the Railway & Locomotive Historical Society, Gilbert H. Kneiss, described the show as a

"...gigantic iron horse opera...with 250 people, 50 horses, and 20 locomotives all operating under their own steam."

The general director of the pageant, Edward Hungerford, was in contact with the V. & T. Vice-President Frank Murphy as early as November 1937 regarding purchase of the V. & T.'s "Genoa" for operation at the New York Fair. Hungerford wanted the engine converted to an oil burner with a small 500 gallon tank, an old style box headlight, balloon stack and painted and lettered as Central Pacific Railroad No. 60 "Jupiter" for use in an 1869 gold spike re-enactment scene. Director Hungerford was hopeful the engine could be brought up to operating Interstate Commerce Commission standards at the V. & T. Shops so that it could economically run under its own power from Carson City to the New York Fair. V. & T. Master Mechanic Edward C. Peterson was optimistic that the shops could render the engine operable again at a repair cost of less than \$1,000 without completely removing the boiler flues, jacket, lagging, etc. Unfortunately, in a letter to Master Mechanic Peterson dated July 19, 1938, chief inspector for the I. C. C. Bureau of Locomotive Inspection John M. Hall was less

than enthusiastic at Peterson's proposal to return the engine to operable condition without performing a major overhaul:

"Please refer to your letter of June 2, relative to the use of your locomotive 12 without removal of flues and jacket and lagging and boiler thoroughly examined, and my reply under date of June 7 in which I stated as follows:

'Our records show that locomotive 12 was built in 1873, the flues were removed and the interior of the boiler inspected in 1908, or 30 years ago, and that it has been out of service ever since that time; therefore, I cannot authorize the operation of locomotive 12 under its own power unless the flues are removed, the interior of the boiler cleaned and inspected, the jacket and lagging removed and the exterior of the boiler thoroughly examined while the boiler is under hydrostatic pressure and the locomotive given all necessary inspections and tests to bring it up to date. Furthermore, I seriously question whether any railroad would permit the use of a locomotive under its own power over their line after having been out of service for 30 years.'

"During my absence from the office your letter of June 20, relative to the same subject, was received, in which you mentioned the pride you take in the care of your equipment, and while agreeing with that statement, I am constrained to advise that we also take a great pride in the remarkable reduction in the number of accidents due to locomotive failures, especially boiler explosions, since the life of this Bureau. As our mission is to promote safety, we cannot authorize the use of locomotive 12 without fully complying with the instructions above quoted.

"In connection with the last paragraph of your letter, in which you advise that you will arrange to comply with our suggestions but that you may know just what is to be done, you would be glad to have our Inspector look over the locomotive before you start to tear her down and inasmuch as I can see no good that would be accomplished by our Inspector coming to your shop for the purpose of inspecting the boiler, I therefore cannot

authorize the expenditure of Government money for that purpose, especially in view of the fact that you are thoroughly familiar with Federal requirements as to inspecting and testing of locomotives and their boilers. Therefore, the instructions given to our Inspector, as stated in the last paragraph of our letter of June 25, have been cancelled."⁶

Ultimately the cost of getting the locomotive to New York was cheaper by shipping it aboard two flat cars rather than by operating it under its own power under applicable tariffs and numerous crew change requirements.

In mid August 1938, Gilbert Kneiss arrived on the V. & T. to conclude purchase of the engine effective August 18th for \$1,275.00, as is, f.o.b. Reno, Nevada. Following heavy surplus equipment sales to Paramount Pictures, the Virginia & Truckee was unable to furnish an old style headlight for the locomotive and the railroad was obliged to manufacture a crude balloon stack at a cost of \$40. Following an insurance inspection by San Francisco Hartford Steam Boiler Inspection and Insurance Company Chief Inspector Grundell, the "Genoa" and V. & T. Combination Car No. 16 were towed dead with rods down and critical parts boxed behind 4-6-0 Second No. 25 from the Carson Shops to Reno on February 24, 1939. Still lettered Virginia & Truckee No. 12, the wood burner traveled east via the Southern Pacific, Union Pacific, Chicago & Northwestern and New York Central Railroads under the onboard care of Gilbert Kneiss to the New Haven Railroad Shops at New Haven, Connecticut. Here the engine was overhauled to carry working pressure and pass a rigid I. C. C. boiler inspection. A duplicate oil burning headlight was built for the engine by Savery Brothers of San Francisco. The water tank was cleaned and tested for leaks, the pony truck wheels were replaced, new flues were installed, a wood pilot and different style bonnet stack were supplied and the locomotive was completely repainted to represent a Central Pacific engine. According to distinguished rail historian and R&LHS Vice-President Gerald M. Best of Beverly Hills, California:

"New Haven shopmen marvelled at the excellent condition of the engine, especially the machinery, for not one nut or hexagonal bolt head had any marks of the machinist's hammer, but then this had always been the policy of the V. & T. shopmen--to use wrenches and cutting oil to loosen the nuts, instead of pounding them with hammers and replacing them with new ones."⁷

During the two seasons from April 29, 1939, through October 1940, the "Genoa" steamed onto the giant open-air stage at the New York World's Fair. Operated by Baltimore & Ohio Railroad Engineer Bob Cranfield, the locomotive steamed onto the platform from stage right to meet a likeness of Union Pacific Locomotive No. 119 in the golden spike scene and then gracefully backed off stage.

At the conclusion of the fair in October 1940, the V. & T. "Genoa" was presented by her owners, the Eastern Railroads Presidents' Conference, to the Railway & Locomotive Historical Society, Inc. for preservation, full restoration, operation and display. Through his connections with Bath & Hammondsport Railroad Secretary C. D. Champlin and his wife's ownership of a block of B. & H. stock, R&LHS member Edward Hungerford was able to secure free covered storage for the "Genoa" and Combination Car No. 16 in a large Bath & Hammondsport shed at Hammondsport, New York. The Delaware, Lackawanna & Western Railroad brought the equipment as far as Bath without charge to the Society and the B. & H. moved the engine over their short line to the Hammondsport storage shed. One report has it that the V. & T. engine operated on the nine mile Bath & Hammondsport for four or five days when one of their own locomotives broke down; the operation reportedly caused quite a stir locally to see an 1873 Baldwin wood burner still in revenue service! The venerable engine remained at Hammondsport until June 9, 1948, when it was sent over to the Illinois Central Railroad Shops at Chicago for reconditioning and subsequent use in another daily gold spike re-enactment scene at the summer 1948 season of the Chicago Railroad Fair. Shortly thereafter, the Pacific Coast Chapter of the R&LHS became responsible for the maintenance and housing of the locomotive.

Under the enthusiastic care of Pacific Coast Chapter Chairman Gilbert H. Kneiss and later Fred A. Stindt who succeeded Gilbert Kneiss in January 1949, V. & T. Locomotive No. 12 has been kept in secure covered storage since its acquisition by the R&LHS Chapter. On numerous occasions the engine has operated under its own power or been placed on public display lettered as either the C. P. "Jupiter" or, historically more appropriately, as the V. & T. No. 12 "Genoa". At the conclusion of its first season at the Chicago Fair, the engine was shipped west in November 1948 for temporary storage generously furnished without charge by the Western Pacific Railroad at their San Jose, California, Roundhouse. On May 1, 1949, the "Genoa" was wood-fired for a San Jose to Oakland excursion over the W. P. for Chapter members. Local newspapers estimated 50,000 persons blocked highways and the Western Pacific right-of-way for a view of the 1873 wood burner and her consist of W. P. Combination Car No. 402 and Caboose No. 773. Eight days later the "Genoa"

END
556

was loaded on a flat car for operation at the summer 1949 second season of the Chicago Railroad Fair.

In his new influential position as W. P. Assistant to the President for Public Relations, Gilbert Kneiss was instrumental in securing free covered storage at the W. P.'s Portola Roundhouse when the 4-4-0 left Chicago in September 1949. At Portola, W. P. shop forces restored the locomotive to its appearance as V. & T. R. R. No. 12 for operation at the W. P. Ruby Spike Jubilee held at Keddie, California, on November 1, 1949. Afterwards, the "Genoa" was returned to Portola.] no

In early May 1953, the American and Combination Car No. 16 were sent over to the W. P. facilities at Reno for operation on a special May 9th three mile excursion out of Reno on occasion of the Ninth Pacific Coast Region National Model Railroad Association Convention meeting at Reno. Following free W. P. storage again at the Portola Roundhouse, the engine was moved during July 1953 to the W. P. Roundhouse at Stockton.

To celebrate the centennial of Southern Pacific Railroad's predecessor company the Sacramento Valley Railroad and 100 years of steam railroading in California, S. P. borrowed the "Genoa" and completely renewed its V. & T. paint scheme for display on August 21, 1955, at the Sacramento Passenger Depot. Afterwards, the engine operated briefly on August 31, 1955, with Combine No. 16 over the Stockton, Terminal & Eastern Railroad for the benefit of a full two page color spread reproduced in Life Magazine. Early in October of the same year, V. & T. No. 12 was transferred from Stockton down to the Oakland W. P. Roundhouse where it operated on October 13th for a 23 mile publicity excursion over the W. P. with Sierra Railroad Coach No. 6 and a W. P. gondola for the benefit of the Bay Area United Crusade. Following covered storage again in Oakland, V. & T. No. 12 was steamed for the last time along the San Francisco Embarcadero on October 30, 1957, for an Arthur Godfrey television show. The wood burner returned to stall one at the Oakland W. P. Roundhouse, her 84 year life as an active steamer having come to a close.

Ownership of the locomotive was officially conferred from the parent R&LHS to the Society's Pacific Coast Chapter on May 3, 1964. With the increased acquisition of vintage railroad equipment and rapidly decreasing storage trackage to house the Chapter's impressive collection, Chairman Stindt was fortunate to secure rental of a former Key System Railway Inspection Barn opposite the San Francisco-Oakland Bay Bridge Toll Plaza in Oakland; the "Genoa" was the second piece of equipment moved into the building onto the west end of the center storage track at 5:45 p.m. on August 11, 1964, by the Oakland Terminal Railway.

Early in 1969, the Southern Pacific Railroad arranged to borrow the "Genoa" for display in connection with the May 10, 1969, centennial of the driving of the golden spike on the transcontinental railroad at Promontory, Utah. Field Manager Nathan H. Mazer of President Lyndon Johnson's Golden Spike Centennial Celebration Commission had contacted the Chapter for display of the locomotive at the National Park Service Promontory site and Southern Pacific offered to restore the engine and arrange for its transportation to Utah in time for the May 1969 re-enactment. The terms of the loan provided for complete static display renovation of the engine to near Smithsonian-quality standards painted as C. P. R. R. No. 60 "Jupiter" yet without any structural modifications. At the conclusion of S. P.'s summer 1969 use of the locomotive, the railroad agreed to restore the engine once again to its proper V. & T. "Genoa" appearance without any cost whatsoever to the R&LHS Chapter.

On March 6, 1969, the "Genoa" was crane loaded and trucked by Bigge Company to the S. P. Sacramento Shops for display renovation as the C. P. "Jupiter". The Westinghouse air pump and front number plate were removed, a bell and frame replaced the stolen one, missing cab fittings were supplied, the engine was completely repainted and all of the brass components were cleaned and highly polished. Chapter members as well as Southern Pacific employees did volunteer work in restoring the "Genoa". Ward Kimball, the late Richard B. Jackson and Harriet and Gerald Best, for example, combined their talents to manufacture a Schenectady-style No. 60 front number plate for the smoke box door. The completed engine was displayed on Front Street in Old Sacramento along with S. P. Diesel SD-45 No. 9000 and later over at the nearby S. P. Sacramento Depot from April 24-27, 1969, before being trucked to Promontory, Utah, for display through early October. Opposite the "Genoa" was old V. & T. 4-4-0 No. 11 "Reno" which the Union Pacific Railroad had borrowed and repainted to represent U. P. Engine No. 119. With the formulation of the California State Railroad Museum at Old Sacramento, the V. & T. "Genoa" became part of a collection of historic equipment conditionally presented by the Pacific Coast Chapter to the State of California effective August 10, 1969.

5/8-11?
see
Part 2

After the Chapter secured custody of the rare S. P. Locomotive No. 1 "C. P. Huntington" in mid 1969, Chapter Chairman Stindt wrote S. P.'s General Public Relations Manager James G. Shea to request that the V. & T. Locomotive "Genoa" be retained as the "Jupiter" so that the S. P.'s budgeted funds for returning the engine to its appropriate V. & T. appearance could be reallocated to restore the "C. P. Huntington". It was concluded by senior Chapter Officers that the V. & T.

engine should be retained in the "Jupiter" paint scheme for several reasons:

- a. in view of the scarcity of Chapter funds to restore the "Huntington",
- b. it was felt at that time that the "Genoa" had more historical significance in its role as the "Jupiter", and
- c. it would constitute tangible evidence and recognition of the Chapter's contribution to the 1969 Golden Spike Centennial effort.

Therefore, the 4-4-0 has been retained to date still lettered as C. P. No. 60 rather than as the Virginia & Truckee No. 12 "Genoa".

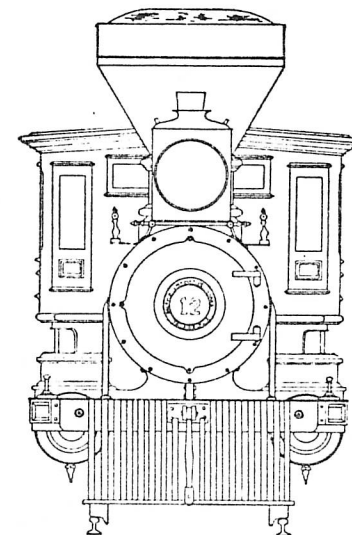
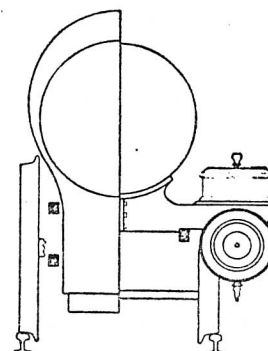
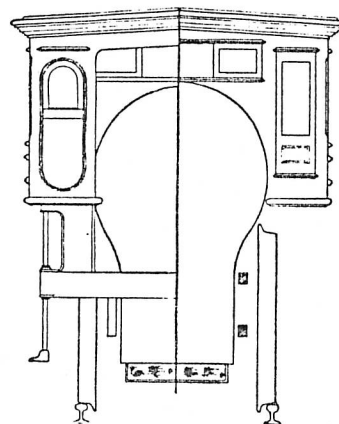
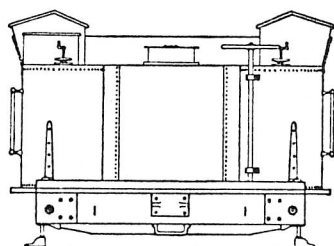
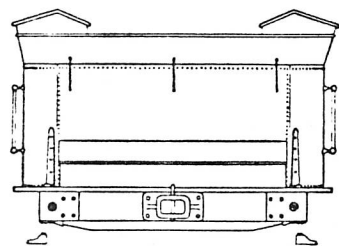
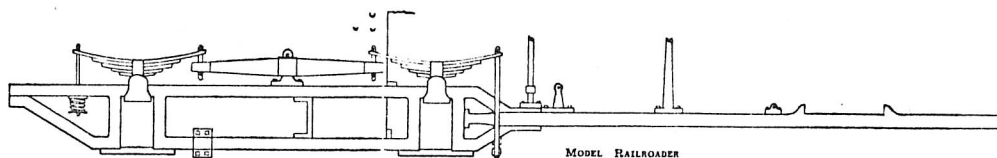
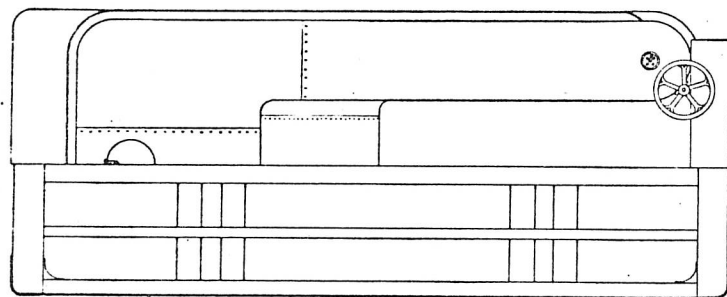
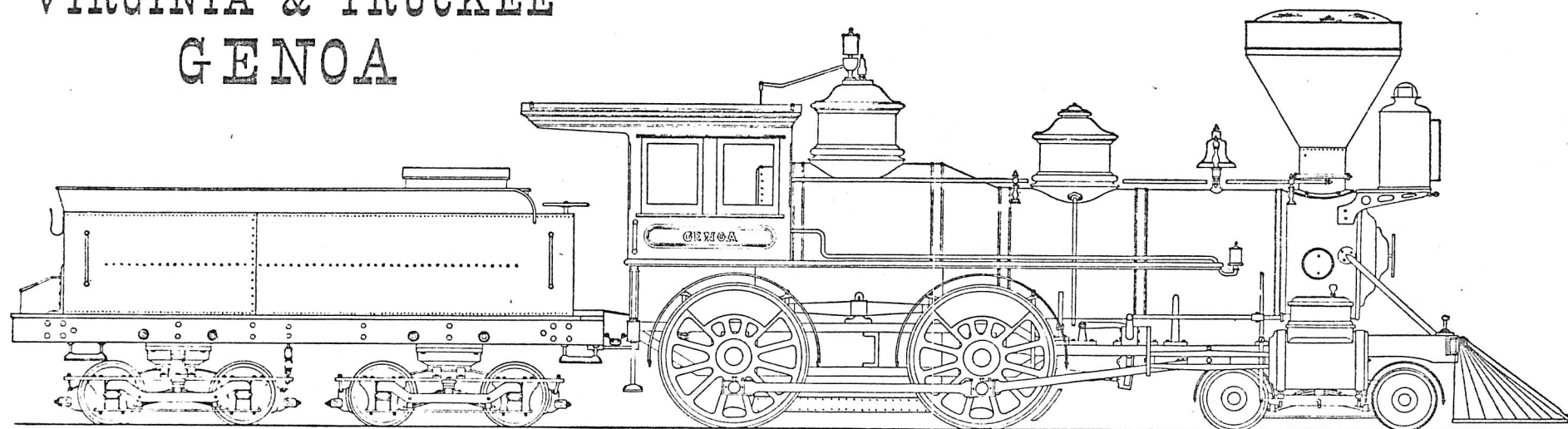
On October 16, 1969, the "Genoa" was loaded at Promontory, Utah, and trucked to Sacramento, California, where Safeway Stores, Inc. offered to provide secure covered storage for the engine at their East Sacramento food distribution warehouse. Here the engine remained until June 30, 1976, when it was wheeled by Central California Traction Company, Southern Pacific and California Department of Parks and Recreation personnel for static unserviceable public display beginning July 3rd in the reconstructed Central Pacific Railroad Passenger Station at Old Sacramento.

The 100 year old "Genoa" has seen decades of skilled handling, superlative care and productive passenger and mixed train operation on Nevada's renown Virginia & Truckee Railroad. The historic brass-studded wood burner ranks today as a classic among existing Baldwin Americans and a highly respected and desired piece for occasional steam operation and fully restored quality museum display.

NOTES

1. M. Baird & Co., Baldwin Locomotive Works to H. M. Yerington, letter, August 2, 1872, Stephen E. Drew Collection, Oakland, California.
2. H. M. Yerington to M. Baird & Co., letter, December 21, 1872, Yerington Papers, The Bancroft Library, University of California, Berkeley.
3. H. M. Yerington to M. Baird & Co., letter, March 15, 1873, Yerington Papers.
4. Territorial Enterprise, November 3, 1874.
5. Gilbert H. Kneiss, "Railroading at the World's Fair", Railroad Magazine, January 1940, p. 6-17.
6. John M. Hall, Chief Inspector, I. C. C. Bureau of Locomotive Inspection to E. C. Peterson, letter, July 19, 1938, Stephen E. Drew Collection.
7. Gerald M. Best, "The Bonanza Twins", The Railway & Locomotive Historical Society Bulletin No. 124, April 1971, p. 5-17.

VIRGINIA & TRUCKEE GENOA



Baldwin Locomotive Works.

M. Baird & Co.

Philadelphia, - 2 Aug. - 1872.

Matthew Baird.
George Burnham.
Charles F. Barry.
Edward H. Williams.
William D. Hensley.
Edward Longstrech.

H. M. Jerington, Esq.,

Supt. Virginia & Truckee Railroad
Carson, Nevada.

Dear Sir: Your favor of 26th July is received.
We enter your order for a locomotive, the Sharon, no. 12,
a duplicate of the Reno except as to smoke-stack, which
is to be a woodburning stack like that on the Washoe
or Nevada.

We put the engine in the first vacant place in our
list which is in February.

Prices of locomotives of this class have advanced
\$2000.00 since January last, owing to the enormous
increase in the cost of iron and other material,
but we enter your order at Fourteen Thousand
Dollars (\$14000.00) including headlight, which we
will try and remember to send with the engine.

We sent duplicate bill of the Reno, 23 July?

Awaiting your further commands, we are,

Very Truly Yours,

M. Baird & Co.

etc

AS-BUILT SPECIFICATIONS

Builder: M. Baird & Company
Baldwin Locomotive Works

Place: Philadelphia, Pennsylvania

Date: January 1873

Gauge: 4 feet 8-1/2 inches, 3/4 inch play

Type: 4-4-0 American

Class: 8-26 C 33

Builder's Number: 3090

Road: Virginia & Truckee Railroad Company

Number: 12

Name: "Genoa"

Service: Passenger

Fuel: Wood

Cost New: \$14,000.00

Tractive Power: 11,705 lbs.

Boiler Pressure: 130 lbs.

Weight

On Engine Truck: 19,500 lbs.

On Drivers: 45,500 lbs.

Engine Total: 65,000 lbs.

Tender Loaded: 48,400 lbs.

Total: 113,400 lbs.

Wheel Bases

Lead Truck: 5 feet 6 inches

Wheel Bases (Continued)

Rigid: 8 feet

Total: 21 feet 9 inches

Boiler

Material: Steel, chipped and caulked

Type: Wagon Top

Dome

Casing: Brass

Beads: Iron

Jacket

Material: Russian Iron

Bands: Brass, raised front band

Safety Valves

Number: 2

Type: M. Baird & Co. Lock, Balance Relief

Gauge Cocks: 3

Furnace

Material: Steel

Length: 65 inches

Width: 34-1/2 inches

Depth: 65 inches

Tubes/Flues

Material: Iron, copper rings on fire box end

Number: 144

Diameter: 2 inches

Length: 10 feet 10-3/8 inches

Steam Pipe: Wrought Iron

Grates: Cast Iron for Wood

Ash Pan: Double Dampers

Cylinders

Number: 2

Diameter: 16 inches

Stroke: 24 inches

Steam Ports: 1-1/4 x 15 inches

Exhaust Ports: 2-1/2 x 15 inches

Valve Motion: Stephenson Link

Bridge Width: 1 inch

Cylinders (Continued)

Eccentric Throw: 5 inches

Valve Travel: 5-1/2 inches

Lap

Outside: 3/4 inch

Inside: 1/32 inch

Lead: 1/16 inch

Exhaust: Double

Oilers: In Cab

Casing: Brass

Covers: Brass

Steam Chests

Casing: Brass

Covers: Iron, brass beads

Piston Packing: Springs

Guides: Iron, case hardened

Crossheads: Cast Iron

Rocker Shafts: Wrought Iron

Drivers

Diameter: 56-3/4 inches

Center Diameter: 52 inches

Journals

Diameter: 7 inches

Length: 8 inches

Tires

Type: Steel, all flanged

Size: 5-1/2 x 2-1/2 inches, coned 3/16 inches

Wheel Covers: Monogram Brass Pipe

Throttle

Type: Balance Valve

Position: In Dome

Smoke Stack

Type: Yankee Balloon, netted for wood

Diameter Inside Pipe: 16 inches

Pumps

Number: 2

Type: 2-1/4 inch hollow plunger brass

Pumps (Continued)

Feed Cocks

Number: 2

Pipes: Iron

Check Pipes: Copper

Checks: Brass Casing

Injectors: None

Sand Box: Brass body, iron beads and pipes

Cab: Walnut, small rounded corners

Pilot: Iron, round bars

Pony Truck

Type: 4 Wheel Swing Center Bolster
Wheels

Diameter: 26 inches

Type: Plate

Journals

Diameter: 4-1/2 inches

Length: 7-1/2 inches

Wheel Covers: Brass Pipe

Tender

Type: 8 Wheel Rectangular

Square Frame: Wood

Trucks: Square Wrought Iron Frame

Wheels

Diameter: 26 inches

Type: High Bridge Plate

Journals

Diameter: 3-1/2 inches

Length: 6 inches

Axles: 82 inches long

Brakes: Double, to both trucks

Brake Beams: Iron

Safety Chains: Single

Tool Boxes: 3, Top and Back

Tank

Height: 40 inches

Water Capacity: 2,200 gallons

Running Boards

Type: Wood

Nosing: Brass

Steam Gauge

Type: Stamp's

Stand: Brass

Bell Stand: Brass, No. 3

Flag Fixtures: Brass, No. 1

Hand Rails: Brass

Oil Cups: M. Baird & Company

Number Plate: Brass

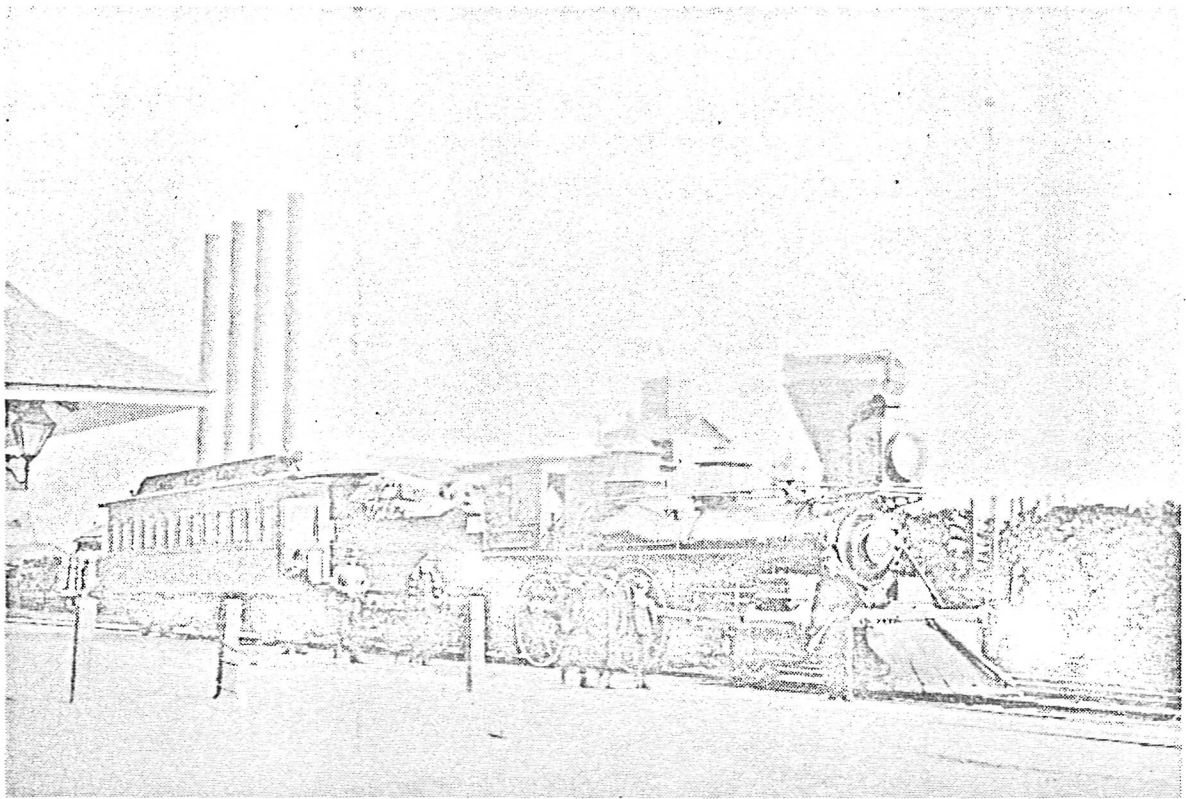
Headlight: Kerosene Burner

Best Passenger Painting, Style No. 2

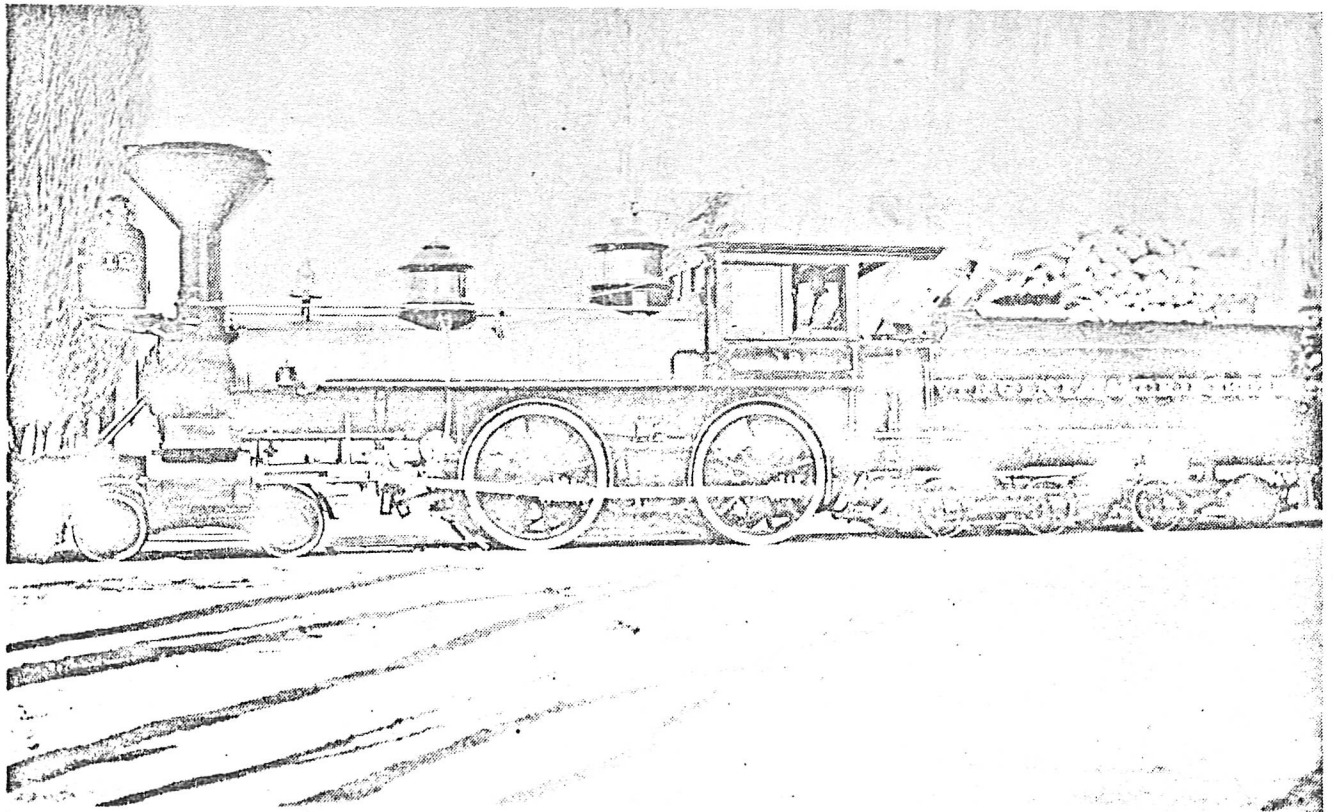
Engine 12.

Pay Roll of the V. & T. R. R. Co. for the Month of March A. D. 1878

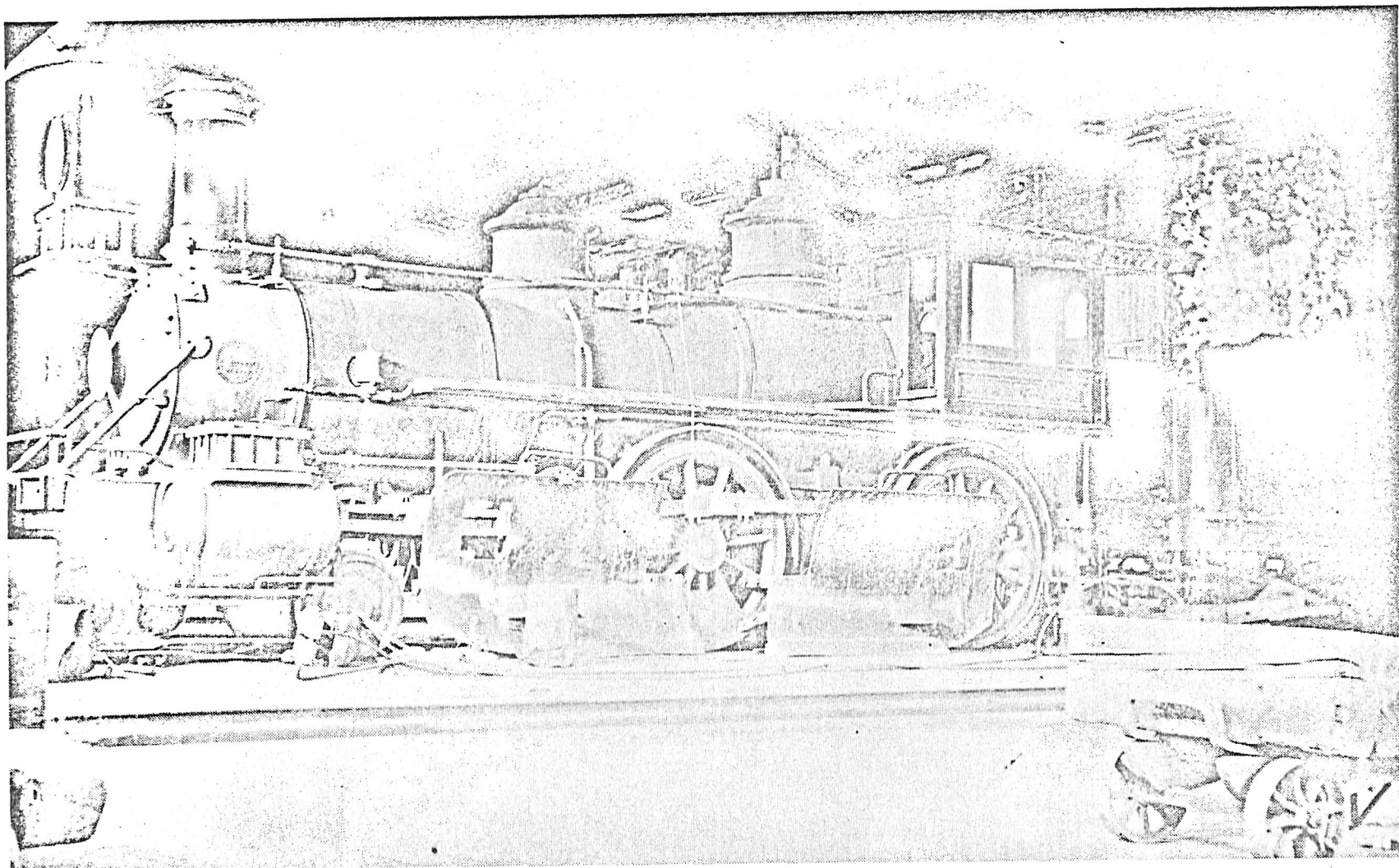
NAME.	Total No. of Days.	Wages per Day.	OCCUPATION.	AMOUNT DUE.	TOTAL AMOUNT.	RECEIVED PAYMENT.
<u>Engine Genoa. No. 12.</u>						
N. H. Purce	2					
M. V. Pollard	3	4/5	4 - Conductor		\$3.20	✓ N. H. Purce
P. N. Kennedy	4	10 3/4	"		43	✓ M. V. Pollard
E. L. Mc. Kellips	5	4/5	5 Engineer		4	✓ P. N. Kennedy
A. J. Smith	6	10 3/4	"		53.75	✓ E. L. Mc. Kellips
H. H. Rice	7	4/5	3.50 Fireman		2.80	✓ A. J. Smith
A. Mc. Donald	8	10 3/4	"		37.62	✓ H. H. Rice
W. Mc. Dade	9	4/5	3.25 Fireman		2.60	✓ A. Mc. Donald
	10	10 3/4	"		34.94	✓ W. Mc. Dade
	11	.	"		<u>\$181.91</u>	✓ P. L. Luman per order 4/5
L.S. 98.17 T.S. 93.74 151.91						



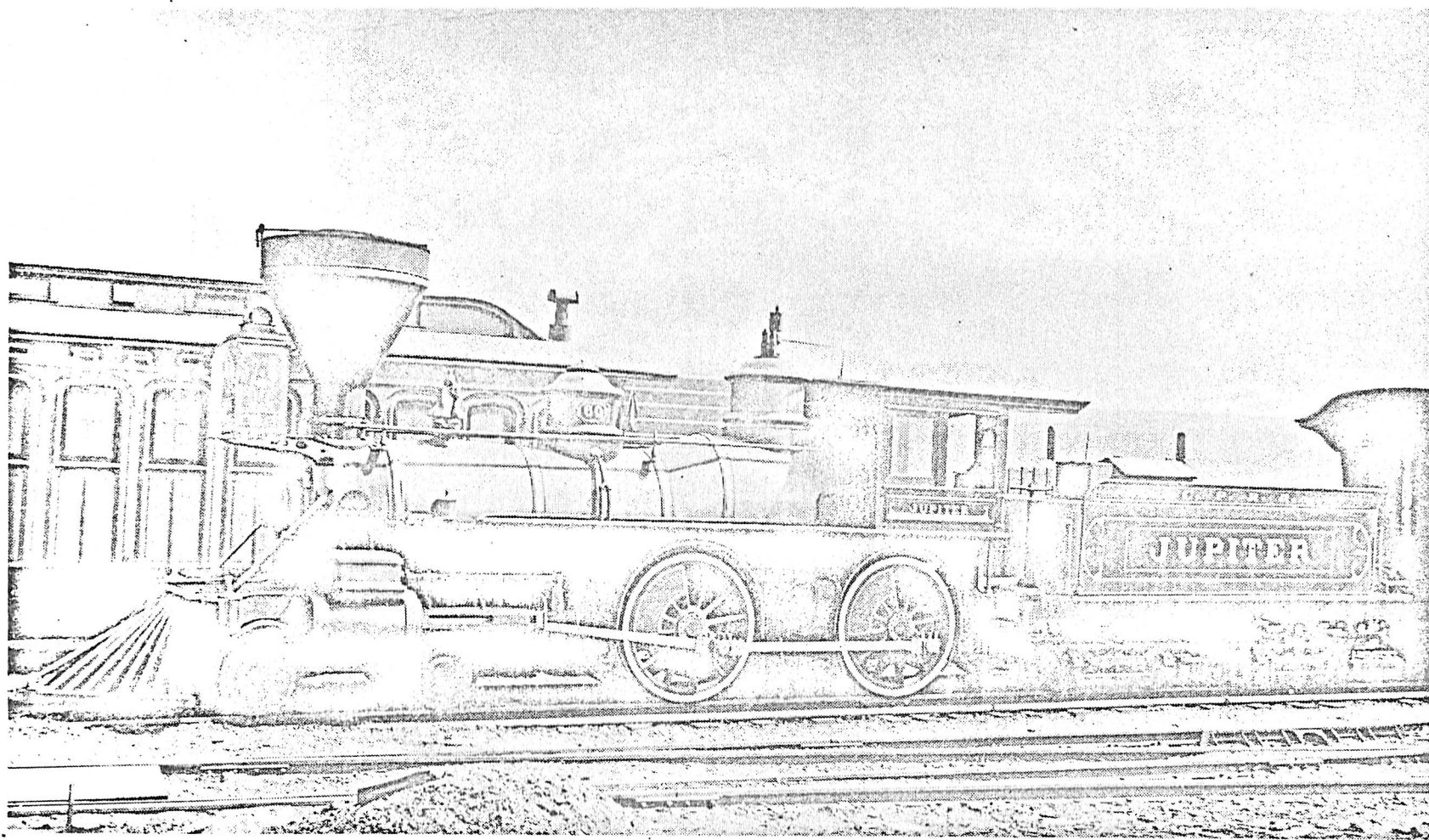
Passenger Depot, Virginia City, Nevada, ca. 1870's



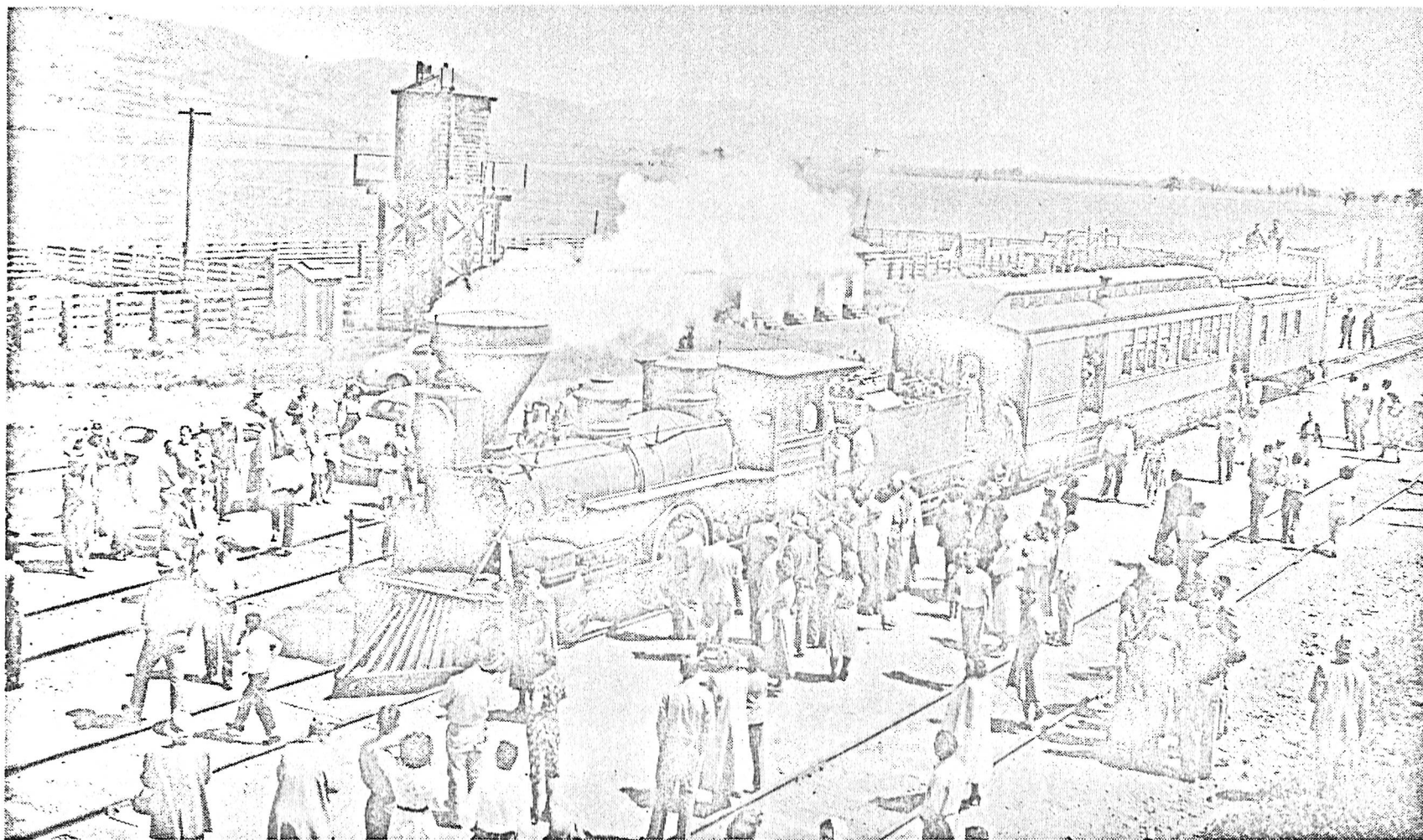
Passenger Depot, Carson City, Nevada, ca. 1902



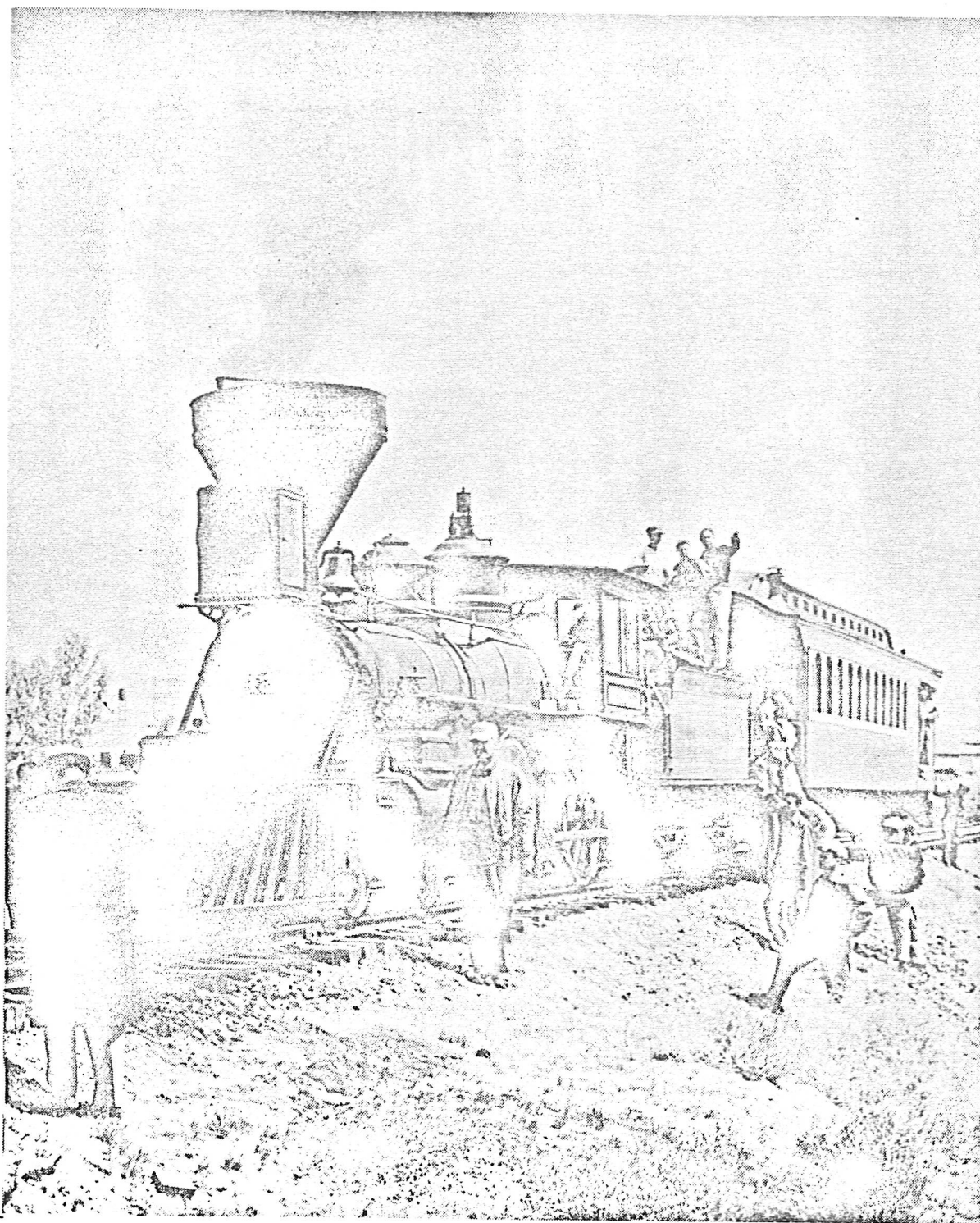
Enginehouse, Carson City, Nevada, July 1938
(John R. Cummings Collection)



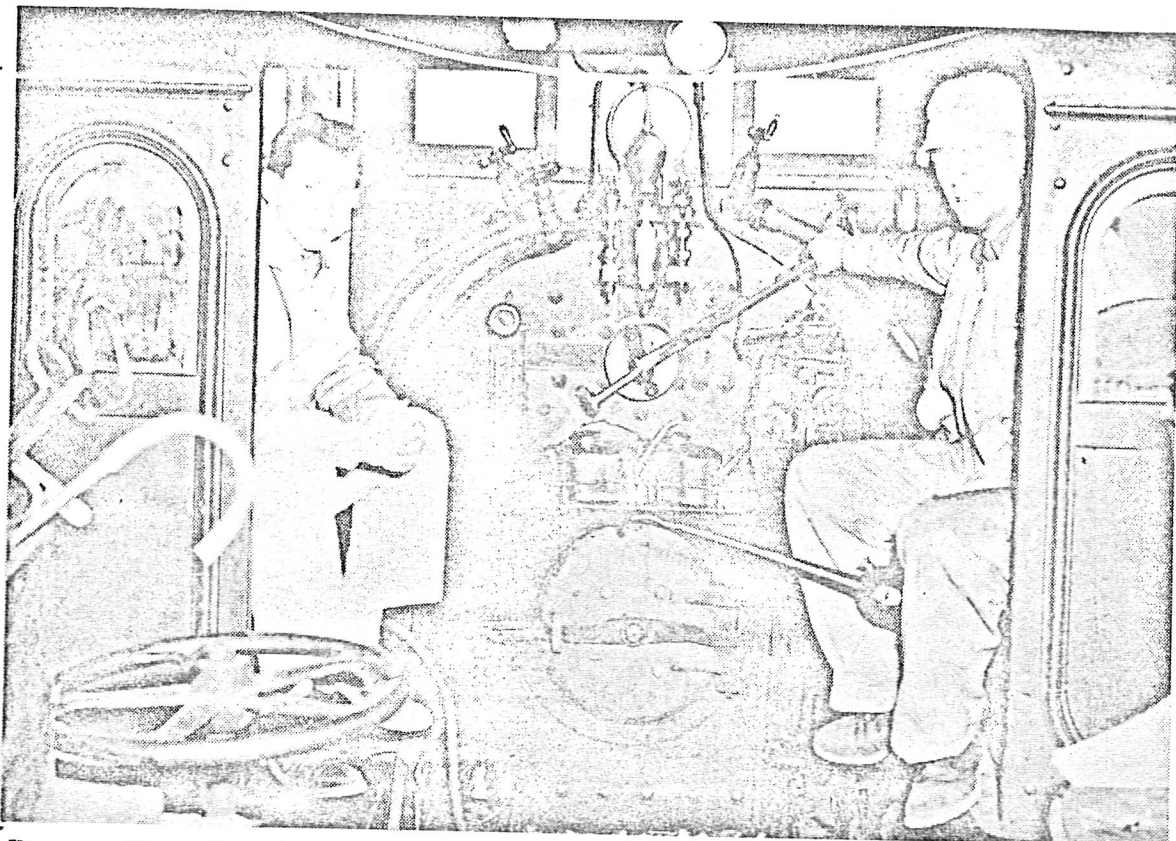
New York World's Fair, September 4, 1939
(West Coast Slides)



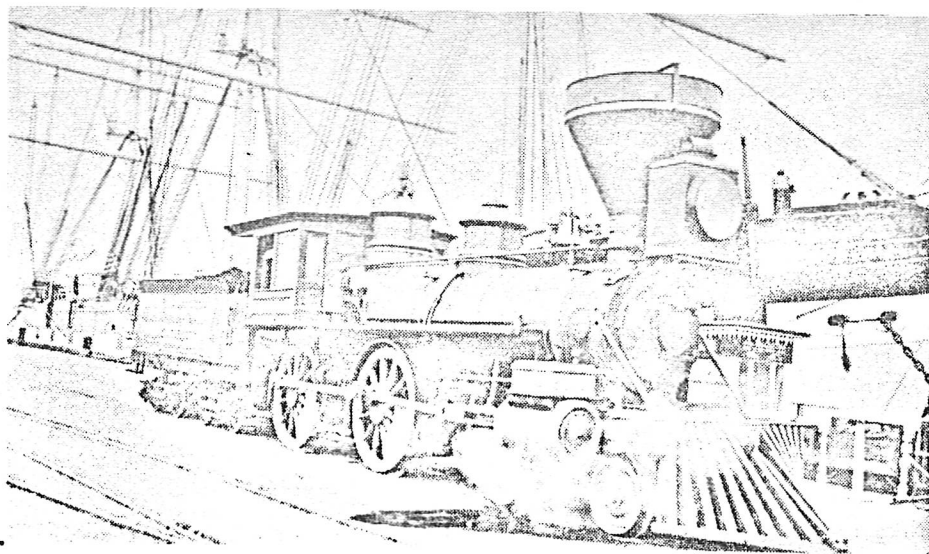
Western Pacific R. R., Milpitas, California, May 1, 1949
(Roy D. Graves Photo)



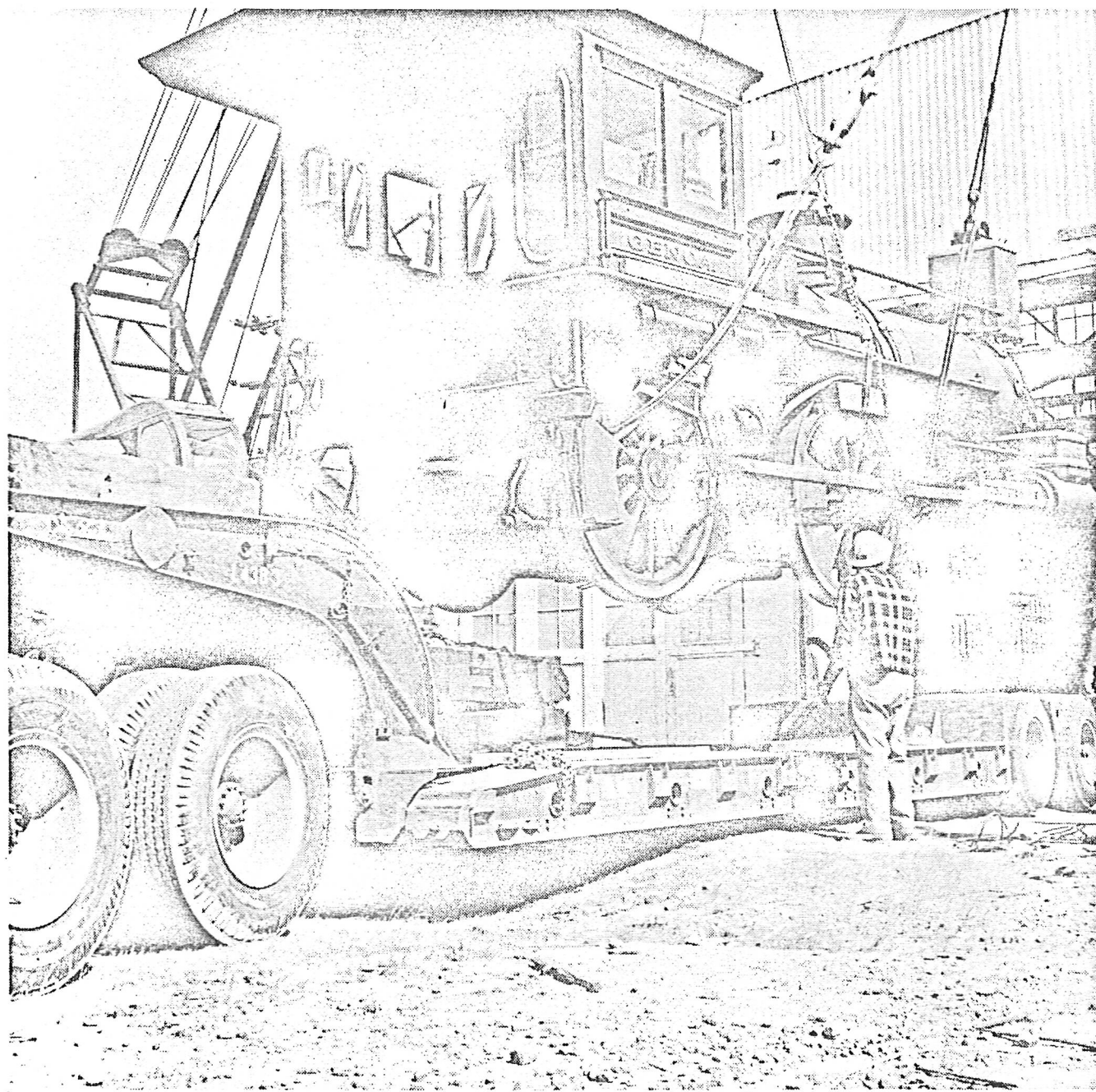
Western Pacific R. R., Reno, Nevada, May 9, 1953
(Western Pacific Railroad)



Reno, Nevada, May 9, 1953
(Nevada Historical Society)

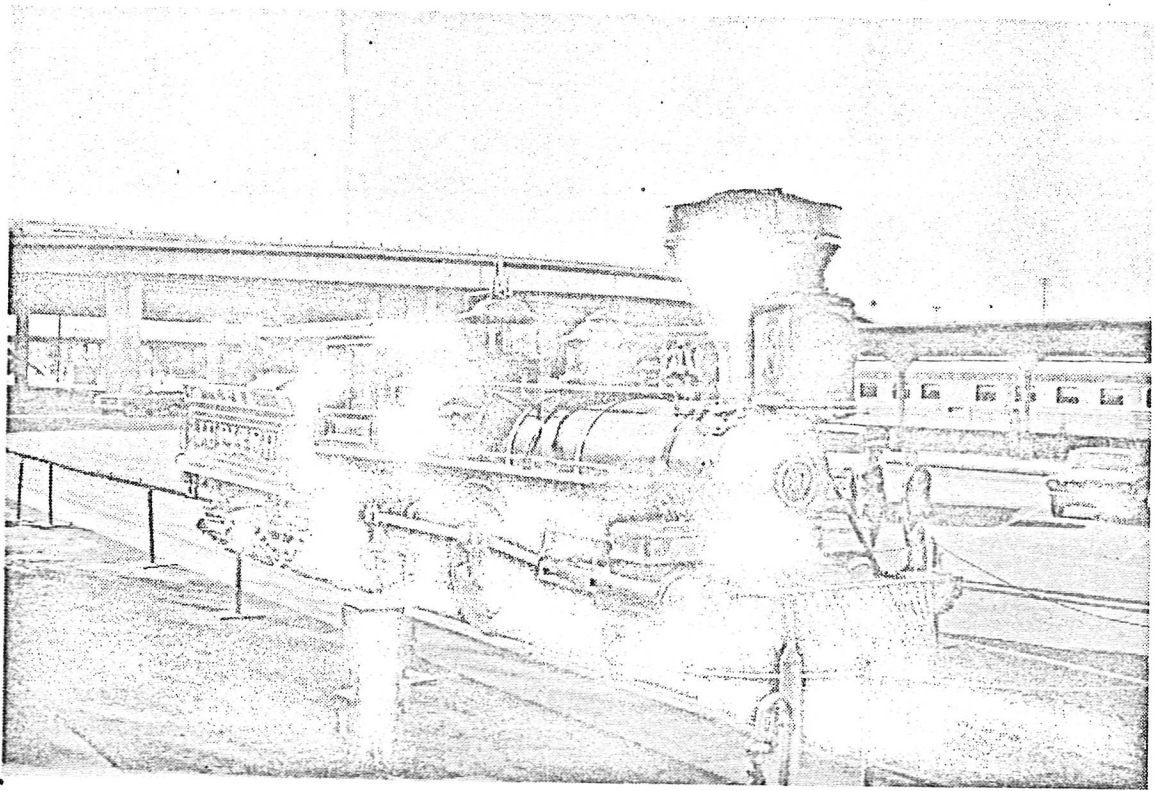


San Francisco, California, October 30, 1957
(Wilbur C. Whittaker)

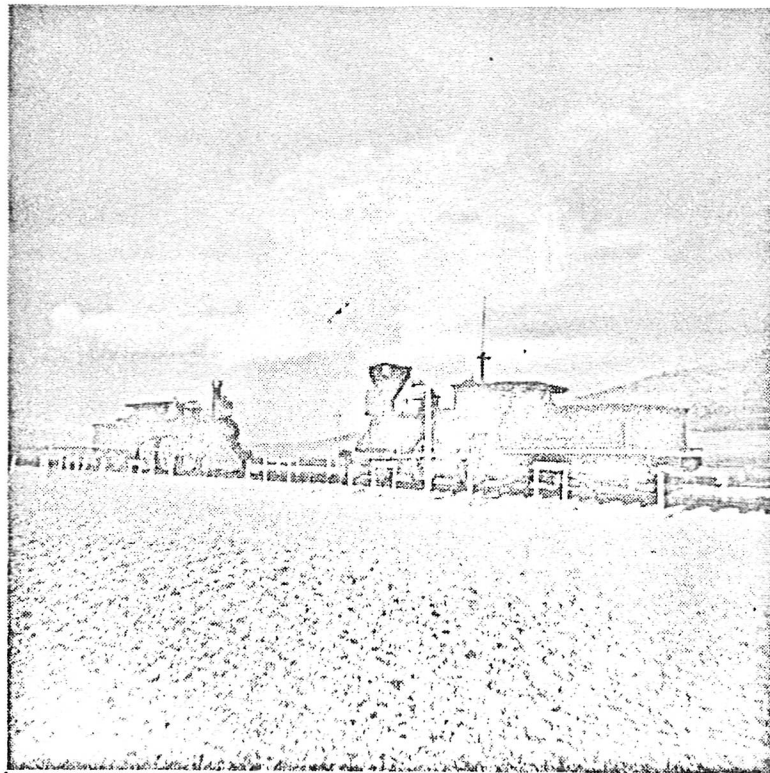


Key System Barn, Oakland, California, March 5, 1969
(Southern Pacific Railroad)

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S. P. Station, Sacramento, California, April 25, 1969



Promontory, Utah, June 17, 1969
(James C. Dunn)

II. CURRENT CONDITION EVALUATION

Virginia & Truckee Locomotive No. 12 "Genoa" was examined inside the food distribution warehouse of Safeway Stores, Inc. on Florin-Perkins Road in Sacramento, California. The locomotive has been stored on rails inside the secure facility since mid October of 1969 when it was returned from static display at Promontory, Utah. In early 1969, the Pacific Coast Chapter of the Railway & Locomotive Historical Society was planning to cooperate in a May 8-11 display of historic engines on Southern Pacific Company's west Sacramento trackage near 7th and "G" Streets. Much of the equipment had to be trucked into Sacramento and the proposed display was contingent on finding a suitable Sacramento storage site for housing the historic engines from the close of the exhibit until formal opening of the California State Railroad Museum at Old Sacramento. R&LHS Chapter Director Dr. Denny S. Anspach conducted an extensive search for a home for the rolling stock and he advanced an April 28, 1969, deadline for finding a site in a last-minute appeal to the Sacramento City Council.

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Utah
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In response to a similar plea in The Sacramento Bee, Thomas Allen, employee-public relations manager for Safeway's Sacramento Division, generously offered several hundred feet of covered tracks in the company's new food distribution center in east Sacramento. The covered trackage was not required by Safeway until 1973-74 and in the interim it could afford temporary storage for the R&LHS's priceless Nineteenth Century locomotive collection. The availability of Safeway's secure trackage assured the May 1969 Sacramento display and the interim housing of part of the R&LHS collection until the opening of the Old Sacramento Railroad Museum and State Park. Since the V. & T. "J. W. Bowker" and Central Pacific Locomotive "Governor Stanford" were first switched into the building by the Central California Traction Company on May 12, 1969, the Safeway site has variously housed up to a dozen pieces of historic railroad equipment belonging to the R&LHS Pacific Coast Chapter and to the State of California.

The 1873 Virginia & Truckee "Genoa" is primarily of steel, iron, brass and wood construction and is structurally sound, solid and stable. The locomotive rests on its own wheels atop standard gauge rails inside the enclosed distribution warehouse. The engine itself is not kept covered with protective canvas or plastic in any manner; as a result, the locomotive has accumulated a light layer of dirt and dust during its seven years in storage.

Mechanically, the engine was last wood-fired and operated

in October of 1957. Failure to completely clean the fire box and air the boiler following this steaming has resulted in some light interior damage. Moisture from ashes and debris left in the fire box has corroded the bottom row of copper-ended flues. Significant boiler and fire box attention will be required before any major reoperation of the locomotive. Under California law, the boiler could likely receive a maximum certified steam pressure rating of only 50 lbs. for reoperation in comparison to its designed 1873 full working pressure of 130 lbs. per square inch. For switching and static display purposes, the wheels and running gear freely operate, when properly oiled, to enable pushing or pulling the engine when not under steam.

The "Genoa" was last repainted during March and April 1969 in the Southern Pacific Railroad Company's Sacramento General Shops. At that time, nearly every visible inch of the locomotive was completely cleaned, painted, varnished, shined and polished for static display during the summer of 1969 at Sacramento, California, and later at Promontory, Utah. By removing the builder's plates and right side air pump, refashioning a front smoke box number plate and complete repainting, the V. & T. engine assumed the cosmetic appearance of an old-time locomotive of the Central Pacific Railroad. Quality part replacement and outstanding workmanship produced an exceptional restoration. The engine was covered during inclement weather while on display in Utah and although the constant daily exposure to direct sun, wind and desert sand have left visible minor dents and scratches on the superlative and costly renovation performed by Southern Pacific. The locomotive has not seen additional cleaning nor repainting since it arrived at the Safeway warehouse directly from Utah in late October 1969. The Safeway facility has provided convenient and excellent secure protection of the "Genoa" and the continuation of otherwise inevitable paint discoloration, vandalism, dirt and debris accumulation has been almost negligible.

Historically, the condition of the engine closely approximates its appearance on the Virginia & Truckee of around 1902-08. The minor non-V. & T. exceptions are its current inappropriate paint coloring and lettering scheme, the temporarily removed air brake equipment, Baldwin number and builder's plates and slight deviations in the exact size and replacement style of smoke stack, bell, head lamp, whistle, pilot and safety relief valves.

Since its construction in 1873, the "Genoa" has had numerous modifications, improvements and part replacements performed in the V. & T.'s Carson City Shops. These have been occasioned through normal engine wear, regular use, extraordinary repairs due to minor derailments

and wrecks, state and federally required safety appliances and to V. & T. modernizing efforts motivated in part by a desire to keep the engine somewhat up to date and in line with the rest of the short line's motive power. Additional numerous part replacements and repairs have been performed on the locomotive since it left V. & T. rails in February of 1939. While an effort has been made on the surface to simulate the engine's early wood burning appearance with a balloon stack and old-style headlight, in reality there still remain many subtle compromising modernizations such as air sanders and new safety valves which easily date the locomotive's current physical and mechanical appearance well into the Twentieth Century.

While once a common everyday sight, the steam locomotive today is a rarity. The V. & T. "Genoa" is an extremely valuable and rare historic railroad piece of Nineteenth Century Americana. The locomotive is 103 years old and miraculously it is relatively complete with most major parts intact and in surprisingly good condition. The engine today evinces decades of meticulous care and faithful service. It is an eye-catching, unique and highly interesting historic piece which richly merits close examination, quality full restoration, authentic period display and public viewing.

Following is a listing of major components in place on the locomotive while in static storage at the Sacramento distribution warehouse. While for cosmetic purposes the engine is presently lettered C. P. R. R. No. 60 "Jupiter", the parts have been evaluated in terms of their appropriateness to the locomotive while on the V. & T. and the original equipment furnished with the locomotive as-built. The majority of components on the locomotive date to the engine's years while with the Virginia & Truckee. The terms "excellent", "very good", "good", "fair" and "poor" are used throughout qualitatively to evaluate the physical condition and suitability of the parts for appropriate restoration and public display purposes. The evaluation is based on the assumption that the engine is intended for static display only; the anticipated reoperation of the locomotive at any time would substantially alter the condition evaluation.

Unless otherwise noted, all modifications or alterations are presumed to have been performed by the Virginia & Truckee at their Carson City, Nevada, Shops between 1873 and 1939, inclusive.

COMPONENT ANALYSIS

Boiler: Original 1873 Baldwin Locomotive Works wagon top type boiler; last reflued March-April 1939 by New Haven Railroad Shops, New Haven, Connecticut.

Jacket: Good condition; fourth section above fire box has been sliced and patched to fit around right side air pump mounts. Jacket should be clear lacquered Russian Iron instead of painted.

Jacket bands: 4, Brass; only one has early style appropriate pressed moldings; good condition. The smoke box first course seam band is still lightly dented throughout despite 1969 restoration attention and careful straightening and proper reinstallation is required.

Steam dome: 1, Iron with brass casing; very good condition. Most of the exposed brass components were surface damaged by dirt, wind and sand while displayed at Promontory, Utah, April-October 1969, and require professional cleaning and polishing. Whistle is a contemporary brass replacement unlike original style furnished 1873 by builder. Pressure relief valves are post 1900 brass safety additions; original pop valve furnished by Baldwin was spring regulated.

Generator: None; never applied. The locomotive was retired and out of service by the time Pyle National electric boiler-mounted generators were installed on most V&T engines in December 1917.

Sand dome: 1, Iron, decoratively numbered "60" in 1969; good condition. As furnished by builder, casing was polished brass which was never painted nor lettered until after leaving V&T in 1939. Air sanders are 1908 modification; original track sanders were single line gravity operated for increased driver traction. Brass ball ornament atop dome missing since 1910-1938; replacement required.

Bell: Iron mount, brass stand, yoke, cord and bell supplied 1969 by Southern Pacific. Original bell assembly stolen 1961-1965 while in Oakland roundhouse storage. Present bell is SP diesel replacement; slightly undersize to original Baldwin bell. Yoke and two posts are well-fashioned 1969 replacements; under-size and slightly different style than original. Boiler bell mount should be solid iron casting instead of light weight 1969 metal plate.

Smoke stack: Wood burning type stack with cinder screen manufactured early 1939 by Savery Brothers, San Francisco, good condition;

Boiler (Continued)

not identical to any V&T stacks likely installed on engine but generally appropriate as old-time style. Original 1873 stack was full balloon Baldwin Yankee stack replaced 1902 by V&T sunflower stack and 1908 by cap stack; make-shift stack funnel on engine when leaving V&T February 1939 was scrapped.

Headlight: Old style box oil burning headlamp applied 1939 at New Haven, Connecticut; very good condition, decoratively painted. Slightly undersized in depth and height to original kerosene style used on locomotive. Two ornate headlight brackets apparently are original; iron casting, very good condition. Brass hand railing and decorative acorn ends intact; very good condition. Brass nosed wooden lamp mounting board is November 1903 V&T replacement; undersized to original style. No headlight was furnished when engine left V&T in 1939.

Hand rails: 2, Brass rods with appropriate acorn ends, turned brass posts; very good condition, highly polished 1969 by SP though recently damaged by desert sand. Decorative acorn turned brass tips for bottom of railing posts missing; removed ca. 1910-1938 while in storage on V&T, 4 required.

Running boards: 2, Wood with brass nosing, very good condition; well-patched around 1969 right side air pump removal.

Builder's plates: None. 2, Brass, removed 1969 while stored in Oakland; 1873 builder's date was removed from plates ca. 1900 by V&T. Two dated plates required for authentic pre-1900 restoration; plates read "Baldwin Locomotive Works Philadelphia 1873 M. Baird & Co. No 3090".

Number plate: Non-V&T style brass spinning affixed and lettered No. 60 for display as a CP engine. Spinning manufactured in Glendale after Schenectady pattern; mount, lettering and painting performed by R&LHS Chapter members Ward Kimball, Gerald and Harriet Best and Richard B. Jackson. Original Baldwin brass number plate removed 1969, presently stored by Chapter Chairman Fred A. Stindt, Redwood City: refinish-ing and reinstallation required for appropriate V&T display. Plate reads "Baldwin Locomotive Works Philadelphia 12".

Boiler stay bolts are solid; surprisingly have not been drilled or tapped to meet contemporary safety requirements.

Boiler checks: 2, Intact. Right side check was relocated below sand dome ca. 1885 by V&T; restored to original location December 1901. Left check has appropriate brass casing and acorn top; right side casing and decorative top missing since ca. 1890--should conform to left side appearance.

Pilot boiler braces: 2, Iron, original; excellent condition.

Boiler (Continued)

Flag holders: 2, Brass turnings, excellent condition; require polishing. Fitted with connecting pipe grab rail ca. 1908; removed 1939.

Fire Box: No major fire box work evident; visible contemporary Baldwin class number imprinted on right side between drivers. Seams apparently working loose from crown sheet inside fire box show visible signs of leaking when last under steam in 1957. Moisture in ashes and debris left in fire box after last operation have caused acid damage to bottom row of copper ringed flues; fire box and tubes should be thoroughly cleaned to prevent further deterioration. Boiler front hand hole is open for proper ventilation; 2 sealed front washout plugs should also be opened. New 108 lb. cast iron fire box door, ring and liner installed August 1902.

Running Gear

Pony truck: 4, 26 inch diameter wheels, worn almost 1 inch. 4 matching brass rimmed wheel guards with turned brass acorn tips required: 2 rear fenders removed by ca. 1902, all fenders removed ca. 1908-1938. Front guards reinstalled 1939 by V&T, slightly altered rear guards fashioned 1940; all 4 require straightening and acorn tip standardization.

Cylinder covers and casings: Brass, good condition; straightened and polished 1969, only minor attention and additional polishing required. Both front covers have been patched where they have worn through. Back right cylinder head flange is broken; requires replacement.

Valves: Stephenson link valve motion type; very good condition. Right side stamped "W. W. Smith April 1918". Painted silver 1969; should be burnished and lightly oiled.

Drivers: 4, Cast iron. Present Midvale steel tires applied October 1901, all flanged; slightly worn. Tires originally tapered or coned 3/16 inch. 4 brass rimmed wheel guards required; intact, very good condition. Left side driver connecting rod is bent due to 1969 improper crane handling; requires straightening.

Suspension system: Stable, intact; good condition.

Pilot apron: Straightened 1969; very good condition.

Pilot beam: Wood, good condition, 2 replacement corner poling pocket iron castings intact. Present castings are smaller replacements applied ca. 1902 replacing larger square iron castings initially added ca. 1880 by V&T for use in freight service.

Running Gear (Continued)

Pilot: Wood, applied early 1939 by New Haven R. R. Shops; good condition, some tightening required. Coupling shaft and rooster intact; applied 1939. Engine never had this type pilot on V&T. Original 1873 pilot was large iron rod construction occasionally covered with light sheet iron for snow removal; modified to wood staved construction February 1902 to accept automatic coupler. Appropriate iron construction pilot required for authentic 1870's era restored appearance.

Pilot coupler pocket: Removed early 1939 in Connecticut during first repainting as C. P. No. 60 for New York World's Fair.

Cab: Wood, as modified and partially rebuilt ca. 1906-08 by V&T; refurbished 1969 by S. P. Shops. Generally good condition with obvious paint chipping and wear from use; present cab is slightly lighter construction than original 1873 Baldwin walnut cab. Square cornered name panels decoratively painted "Jupiter" in 1969; panels originally had rounded end moldings and name "Genoa" applied in raised brass letters. Panels bore "12" beginning in 1902 and were modified to present square end corner construction ca. 1906-08.

Windows: 10, Glasses intact.

Hand rails: 2, Original style ornate polished brass hand grab rails; excellent condition, require polishing only.

Floor boards: Wood, fair to good condition.

Seats: 2, Wood with cushion, good condition. Seat boxes are old construction; cushion missing on fireman's side.

Lubricator: Nathan replacement applied ca. August 1889. Present partial valve and piston rod oil cup lubricators furnished 1939 by New Haven and 1969 by SP.

Steam gauge: 1, Intact.

Injectors: 2, Monitor No. 7 applied November 1901; remove for authentic pre-1901 restoration. No injectors furnished with engine when built.

Backhead fittings and plumbing: Majority are generally appropriate to V&T operation though not necessarily original 1873. Whistle rod to cab missing. Safety valve rod missing, ratchet still intact. One tri-cock missing. Some valve handles are obvious contemporary replacements too lightweight in construction for period 1873 restoration. Oil can rack and ornate brass posted railing intact; straightened 1969 by SP.

Boiler badge plate: Ca. 1908-12 V&T addition, denotes water test 163 lbs. and working pressure 130 lbs.

Back engine apron is contemporary replacement; a more suitable iron plate would be appropriate.

Tender

Underframe: Wood, very good condition.

Water tank: Iron, "U" shape type, fair condition; requires scaling. Rear sections of flared tank railing have been dented, broken and patched through normal wood storage use; some straightening required. Tank is not water tight.

Tool boxes: 3 Wood boxes required; 2 intact on either front side of tank behind spare part boxes; rear tender box removed 1969.

Foot boards: Rear tender wood footboards added between 1902-1906; removed by 1939.

Safety chains: 4, Single type, intact.

Rear tender hooks: 3, Intact, towing wire and portable rerailing hooks required for serviceable appearance.

Foot plates: 4, Ornate original iron foot step castings intact; excellent condition.

Hand rails: 4 Brass original style intact mounted at tank corners. Rear tender iron grab railing is ca. 1905 addition; remove for authentic pre-1905 restoration.

Rear coupler pocket: V&T ca. 1905 replacement iron casting, excellent condition, as on V&T "Empire"; nearly identical to original style furnished by builder. Casting marked "V & T R Y".

Trucks: 2, Four wheel wood frame, good condition. Wheels are worn 26 inch diameter Labdell and Taylor wheels. One journal box cover broken; appropriate replacement required. Originally had paper-type wheels as on V&T "J. W. Bowker".

Lower tender wood storage area has partially fitted 1969 non-prototype hollow plywood box spacer; conceived to achieve visual effect of fully wooded tender for public display without using a full load of cord wood.

Sides lettered "C. P. R. R. Jupiter" and numbered "60" on rear.

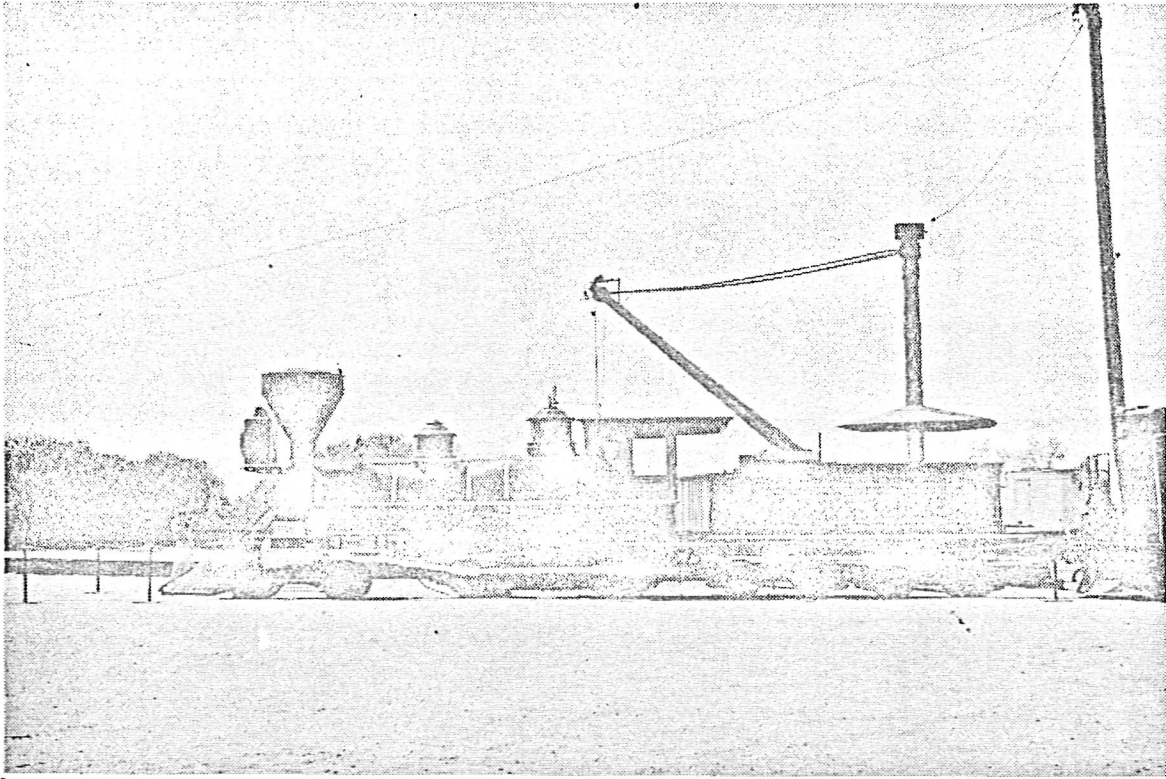
Air Brake Equipment : Westinghouse and American Air Brake Company engine and tender system No. 17885 initially applied November 1874 and updated June 1892 to 8 inch system and February 1902 to present 9-1/2 inch schedule. All rigging, lines, valves intact except for 10 x 24 inch 1902 auxiliary reservoir, air pump and connecting air lines removed 1969 during conversion to "Jupiter"; parts held in storage at SP Sacramento Shops. Right side boiler air pump mounts were not removed upon 1969 pump removal and they still protrude through boiler jacket for no apparent purpose; wooden footboard was filled in, however, at pump location. Cab brake stand is likely a non-V&T 1939 replacement installed for reoperation of engine; driver brake shoe holders are ca. 1910 replacement castings, some marked "V & T Eng 15" in raised letters. All air brake equipment, train line

Air Brake Equipment (Continued)

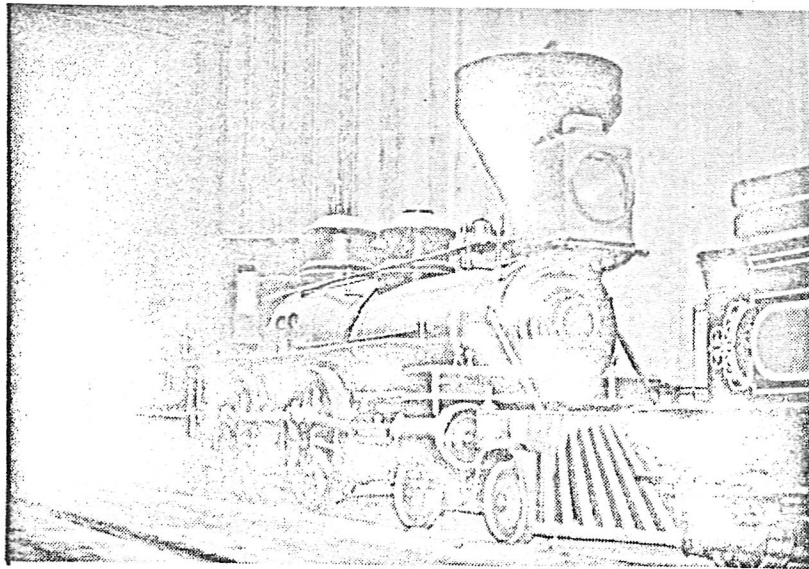
and independent are 1874 additions with successive modifications; complete removal required for authentic 1873 as-built display restoration or modification for later day renovation. Originally built only with manually operated tender double wood brake beams.

Draft Gear: Pilot coupling pin fashioned 1939 and replacement V&T coupling pocket casting on tender which previously held 1902 Tower automatic knuckle couplers. Originally built 1873 for link and pin and later Miller couplers; converted 1902 to Tower Janney-style. Oversized National coupler in rear pocket temporarily installed 1969 to facilitate easy moving for display and storage purposes; to be removed for uncoupled display. Both front and rear couplings are functional; engine has been pushed and towed by both since 1969.

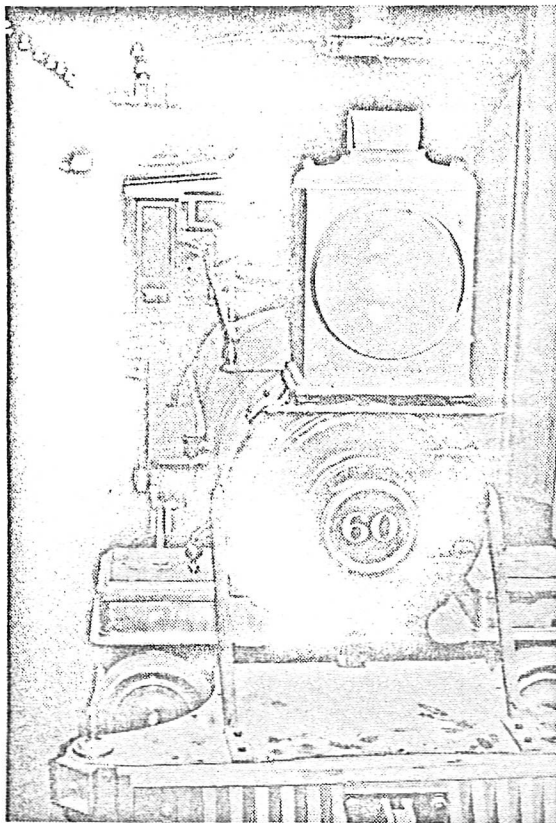
Color Scheme: Applied 1969 to depict C. P. No. 60 "Jupiter" attire; cleaning, repainting, straightening and additional brass polishing required prior to attractive public display. Presently blue-grey jacket; dark blue smoke box and stack; wine red headlight, cab and tender; crimson wheels and cab windows; silver rods and running gear; black truck frames; shaded gold leaf lettering, numbering and decorative filigree; and highly polished brass boiler jacket bands, footboard nosing, bell stand, bell, steam chest covers, boiler check, hand rails and brackets, cylinder coverings, number plate, wheel guard rims and whistle.



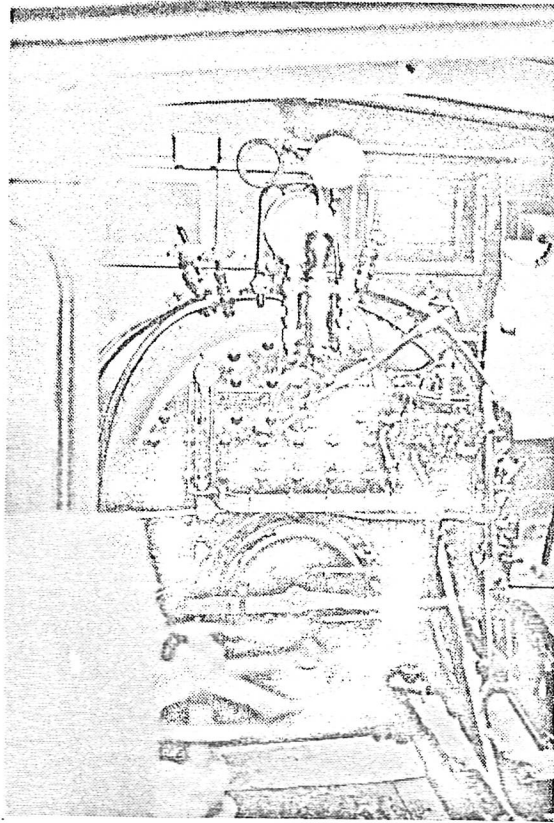
Sacramento, California, April 25, 1969



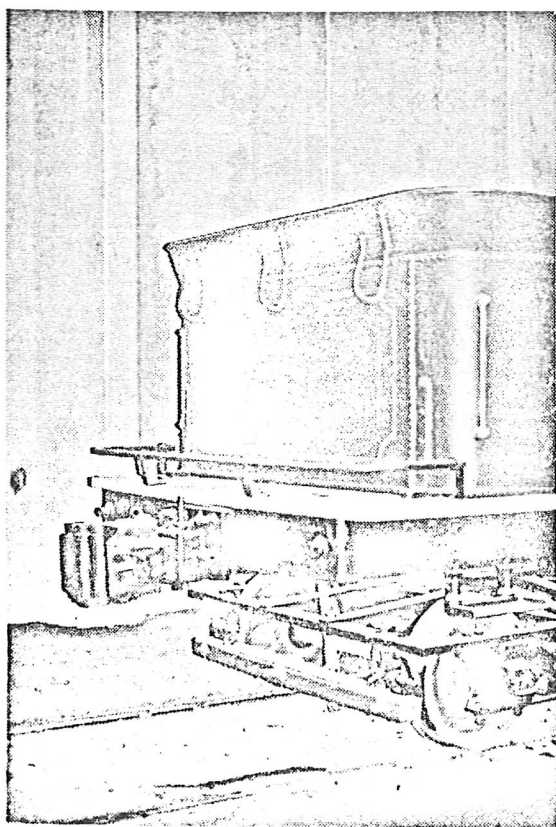
Sacramento, California, March 5, 1976



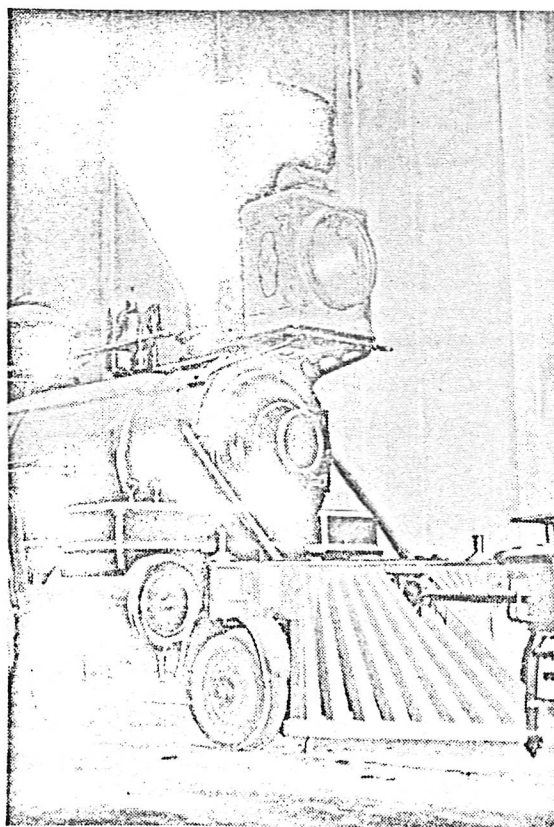
Headlight and apron



Boiler back head



Rear tender

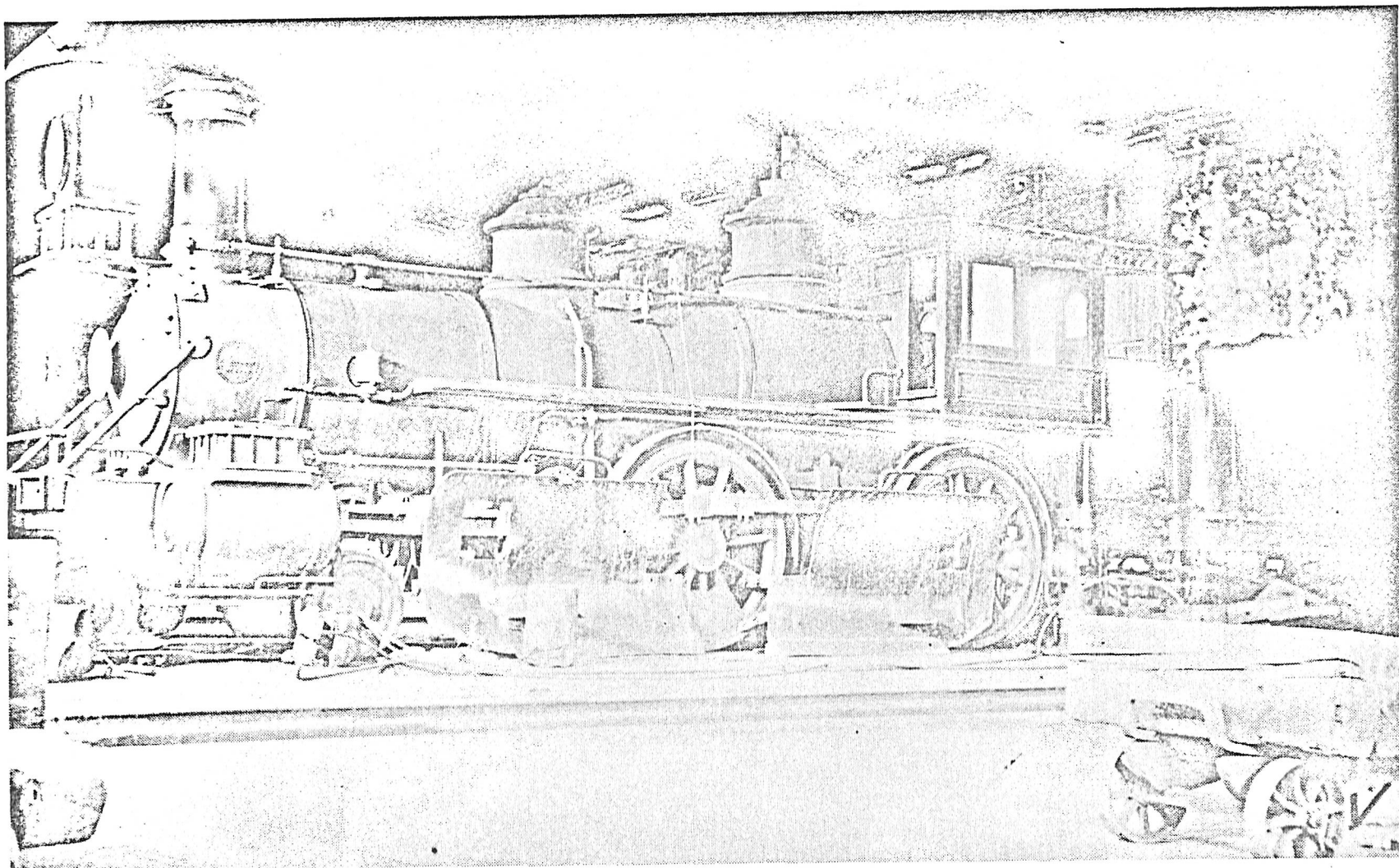


Pilot and front

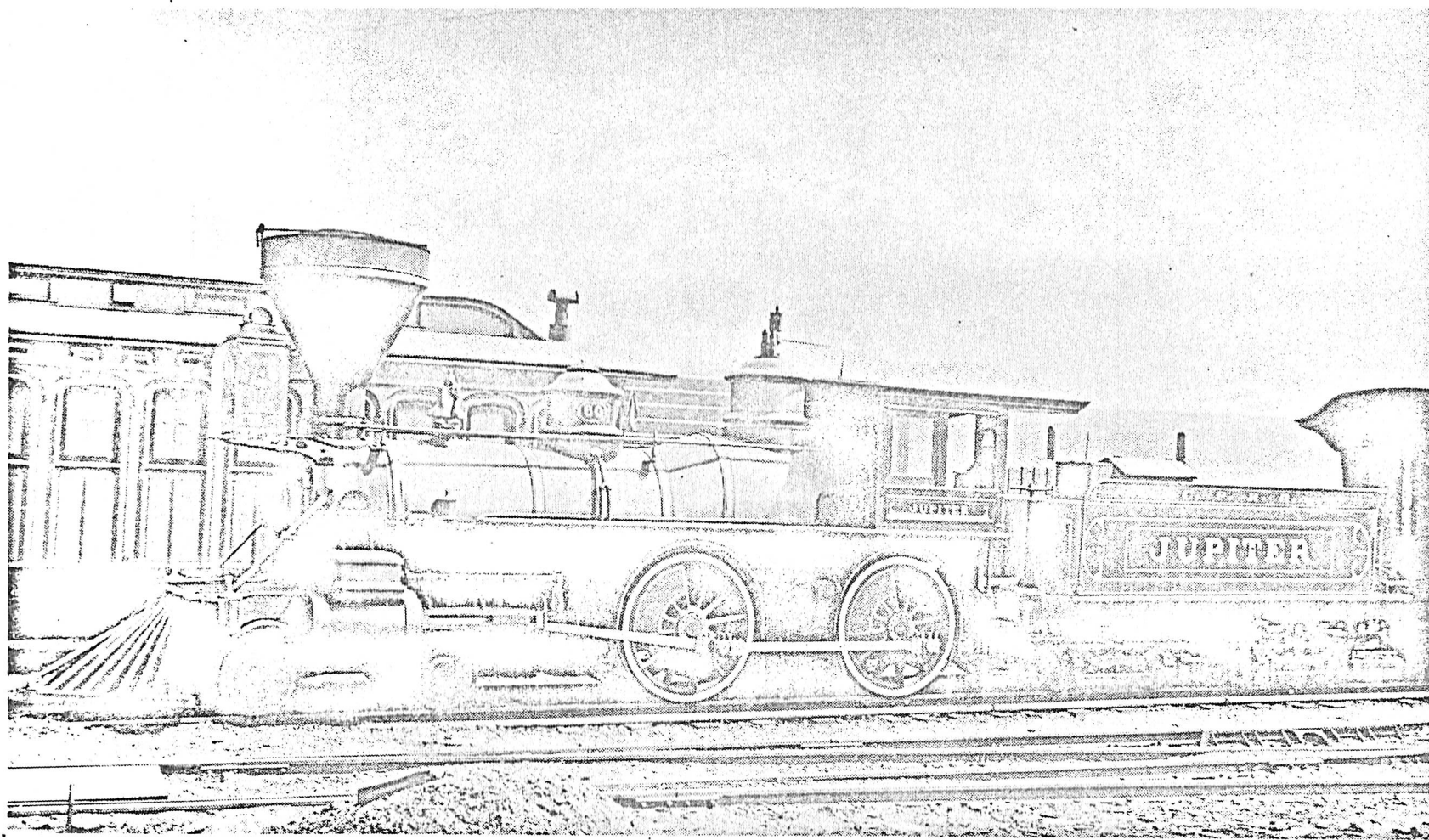
Engine 12.

Pay Roll of the V. & T. R. R. Co. for the Month of March A. D. 1878

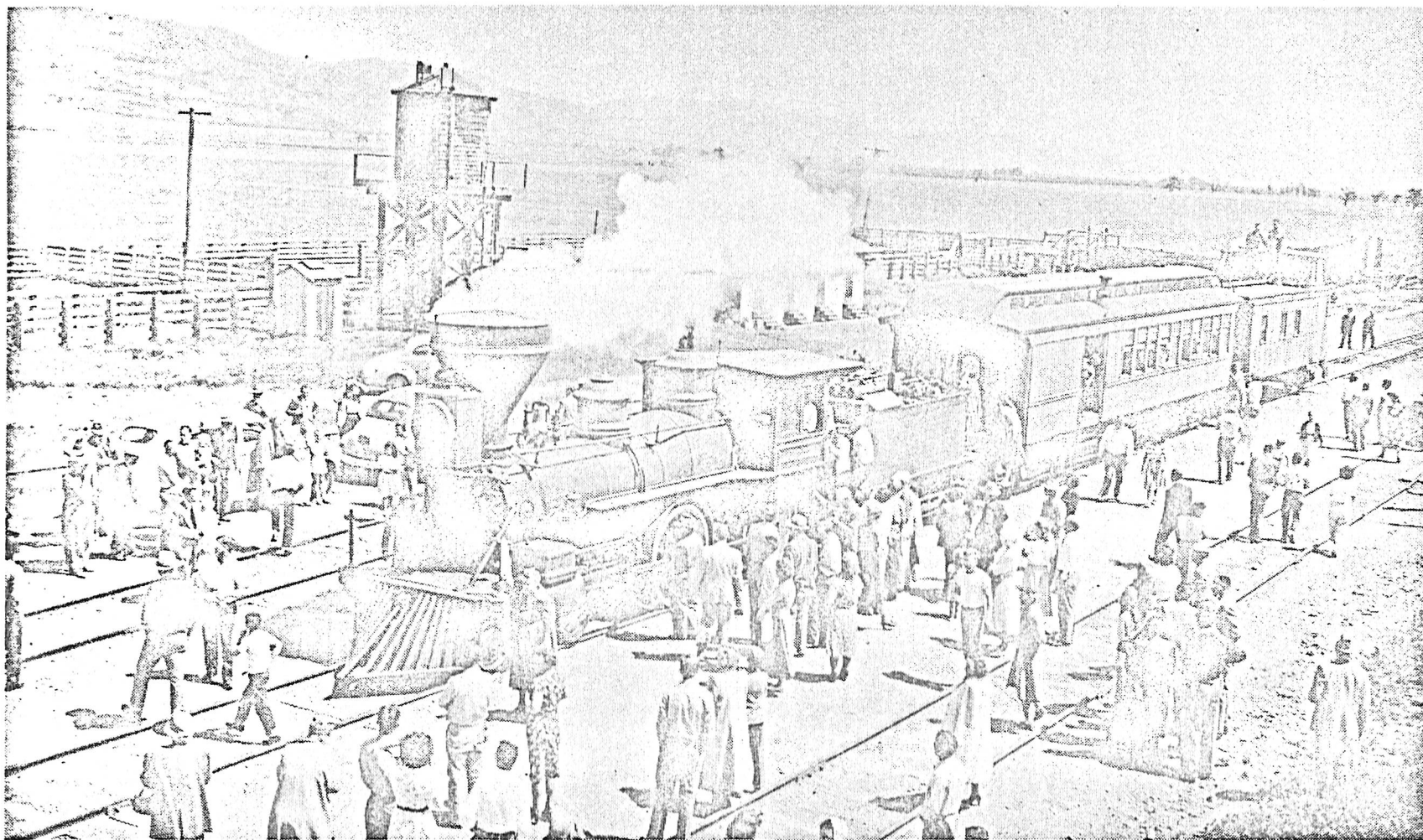
NAME.	Total No. of Days.	Wages per Day.	OCCUPATION.	AMOUNT DUE.	TOTAL AMOUNT.	RECEIVED PAYMENT.
<u>Engine Genoa. No. 12.</u>						
N. H. Purce	2					
M. V. Pollard	3	4/5	4 - Conductor		\$3.20	✓ N. H. Purce
P. N. Kennedy	4	10 3/4	"		43	✓ M. V. Pollard
E. L. Mc. Kellips	5	4/5	5 Engineer		4	✓ P. N. Kennedy
A. J. Smith	6	10 3/4	"		53.75	✓ E. L. Mc. Kellips
H. H. Rice	7	4/5	3.50 Fireman		2.80	✓ A. J. Smith
A. Mc. Donald	8	10 3/4	"		37.62	✓ H. H. Rice
W. Mc. Dade	9	4/5	3.25 Fireman		2.60	✓ A. Mc. Donald
	10	10 3/4	"		34.94	✓ W. Mc. Dade
	11	.	"		\$181.91	✓ P. L. Leman per order 4/1
L.S. 98.17 T.S. 93.74 151.91						



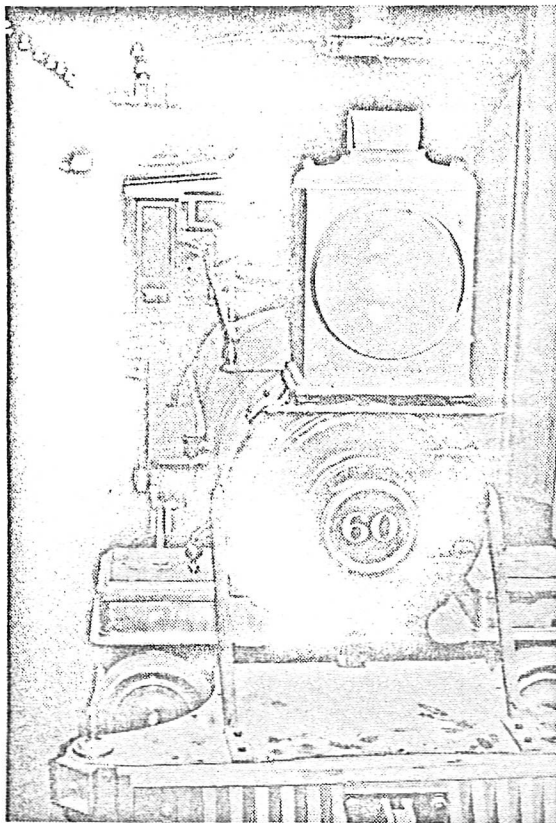
Enginehouse, Carson City, Nevada, July 1938
(John R. Cummings Collection)



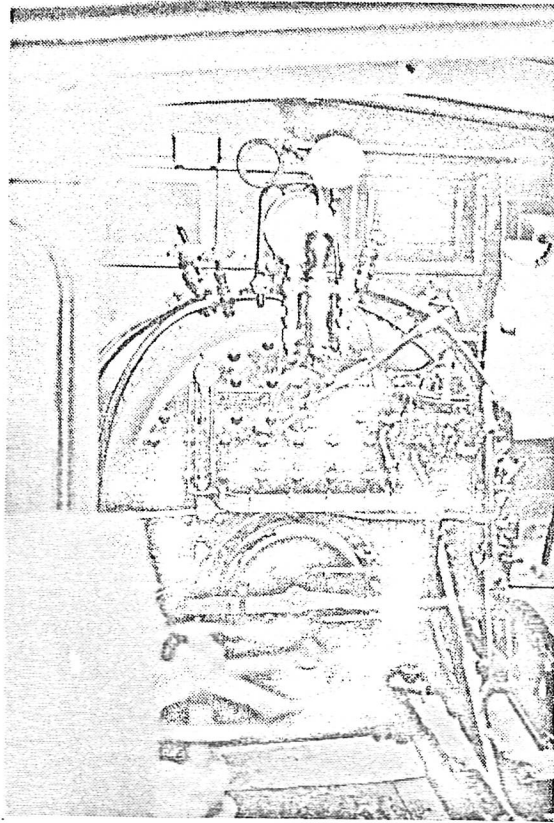
New York World's Fair, September 4, 1939
(West Coast Slides)



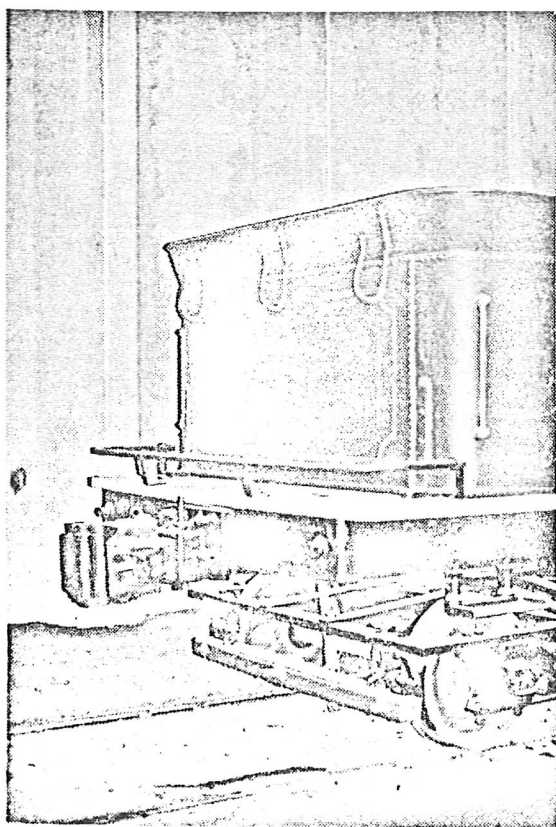
Western Pacific R. R., Milpitas, California, May 1, 1949
(Roy D. Graves Photo)



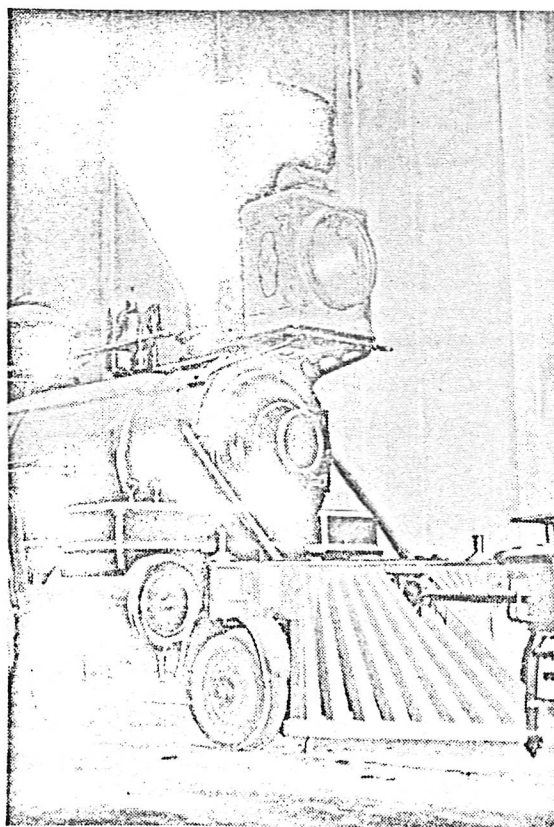
Headlight and apron



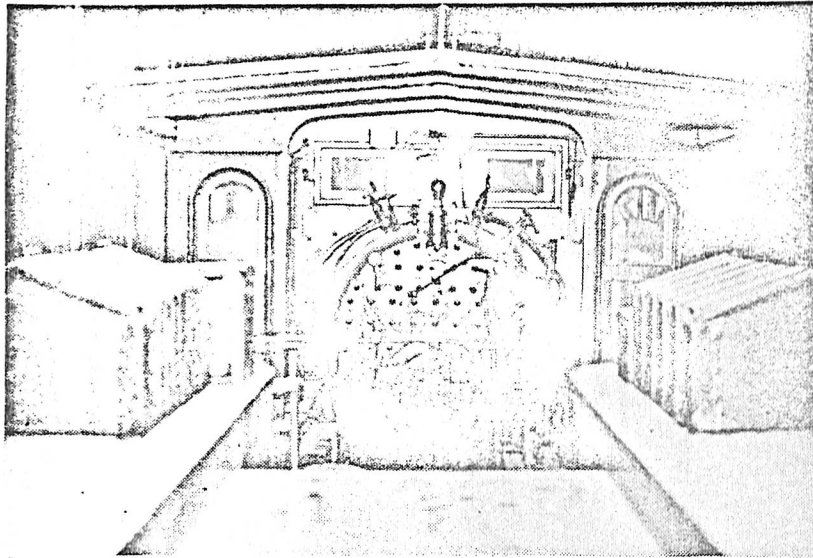
Boiler back head



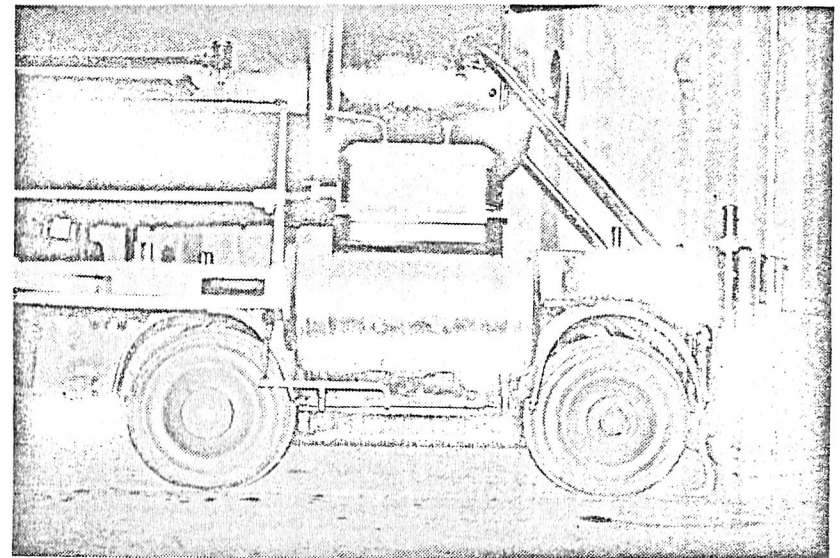
Rear tender



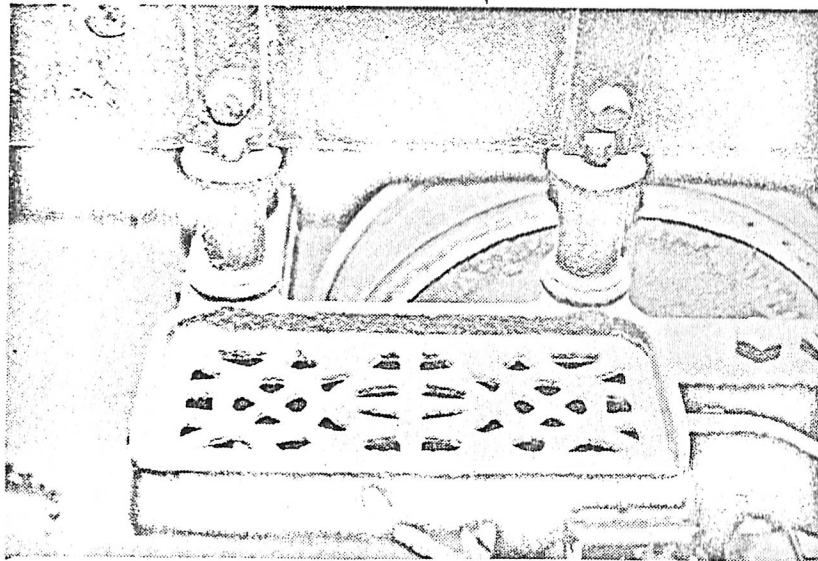
Pilot and front



Rear Cab



Cylinder and pony truck



Cast tender foot plate



V&T Coupler pocket casting

III. RESTORATION RECOMMENDATIONS

The following recommendations are for quality full static display restoration of the Virginia & Truckee "Genoa". This locomotive has been selected by the R&LHS Pacific Coast Chapter and California Department of Parks and Recreation to epitomize the technological state of the art of railroad locomotive engineering of the 1870's. Present plans call for the engine to occupy a key position in the California State Railroad Museum's transportation history building where it will be surrounded by a myriad of mirrors to allow its polished 1873 machinery and pride in craftsmanship to set the standard for display and public viewing for the rest of the equipment collection. For this reason, it is recommended that the locomotive be accurately and painstakingly restored to an 1870's appearance as built. At the present time, the engine's modified physical state is that of an early 1900's machine of circa 1902-08.

For promotional reasons, the locomotive has been retained painted as the Central Pacific No. 60 "Jupiter". Other than the fact that the original "Jupiter" and the "Genoa" were both standard gauge 4-4-0's, there is hardly any resemblance between these two locomotives and little structural or solid historical connection between them. The original "Jupiter" was built five years earlier by an entirely different Eastern builder than the V. & T. "Genoa". The 1868 C. P. "Jupiter" was constructed with larger 60 inch diameter drivers than the "Genoa" and with a distinctive Schenectady steam dome wholly unlike the 1873 Baldwin 4-4-0's. The original "Jupiter" was scrapped on the Gila Valley, Globe & Northern Railroad in 1901 and since that time many other existing steam engines have been temporarily repainted to try to resemble this famous locomotive. The U. S. National Park Service has recently contracted with the steam locomotive boiler firm of Chadwell O' Conner Engineering Laboratory, Pasadena, California, to reconstruct a full scale working replica of the "Jupiter" for display at Promontory, Utah. Other engines imitating the "Jupiter"--like the V. & T. "Genoa"--will undoubtedly lose their historical credibility when the fully accurate replica is placed on prominent national public display.

It is our consulted opinion that the V. & T. "Genoa" in its present "Jupiter" paint scheme has no historical value and little structural resemblance to the original Central Pacific "Jupiter". The full quality restoration and public display of this V. & T. locomotive can only be achieved by restoring the engine to its unique, historically accurate and credible appearance as the Virginia & Truckee No. 12 "Genoa". Regardless of which restoration period is selected, the historical value of the locomotive and its museum display credibility lies in restoring it to a

proper Virginia & Truckee Railroad appearance.

The total restoration of the engine to its original 1873 as-built appearance for purposes of prominent non-operating display will cost approximately \$23,000 including all materials and labor. The major work to be performed includes a thorough cleaning, straightening and tightening; replacement of the pilot, bell and headlight; removal of all air brake equipment; replacement of nearly all wood pieces including the cab; appropriate replacement of safety valves, whistle and boiler jacket; replumbing and refitting of the engine; reworking the tender; and complete repainting to original Baldwin Locomotive Works specifications.

Less than three dozen 4-4-0 steam locomotives are in existence in the United States today. Of these, the V. & T. No. 12 ranks among the five oldest standard gauge 4-4-0's in the country. The rarity and uniqueness of the Virginia & Truckee "Genoa" amply qualifies it for full restoration and center stage mirrored display as a glistening, prime example of the 1870's technological state of the art of railroad locomotive engineering, craftsmanship, endowed personality and pride in mechanical construction.

✓
11/89

Report on Restoration Options
for the
Virginia & Truckee 4-4-0 Number 12
the "Genoa"

In March 1868 the Virginia & Truckee Railroad Company was incorporated by the financial interests of the Bank of California to build a railroad from Virginia City, Nevada, to the Carson River and Carson City, Nevada. Construction was started in February 1869 and carried forward rapidly to completion in January 1870. Between 1871 and 1872 the line was extended to Reno, Nevada. The line continued in this form until 1905, when a branch was built from Carson City to Minden, Nevada. In 1938 the line from Virginia City to Carson City was abandoned, and in 1950 the remainder of the line ceased operation.

With the completion of the line to Reno imminent, in mid-1872 the Virginia and Truckee ordered a new passenger locomotive from the Baldwin Locomotive Works to supplement the one recently received from that company. This locomotive became the number 12, the "Genoa", and entered service in early 1873. In October 1874 the "Genoa" was involved in an accident, and when it emerged from the shops in November, it was the first V&T locomotive to have air brakes. In 1902 the #12 was given a major overhaul in the Carson City Shops. It continued in service until the end of 1908, when it was placed in storage at Carson City. It remained there until 1938, when it was sold and began its excursion and display service, eventually coming into the hands of the Pacific Coast Chapter of the Railway and Locomotive Historical Society, who donated it to the State of California.

In restoring the "Genoa" there are three feasible options. The first is to restore it to its early to mid 1870's appearance. The second is its 1902-1908 appearance. Third is to leave it essentially the way it is. Following is a discussion of the options and a chart comparing them.

An 1870's restoration would be the most extensive and most expensive for the "Genoa". We do have pictures of it, and of sister engines for this time period, as well as the builder's specifications. A restoration to this time period would require a number of fairly major changes which would reduce the artifact value of the piece, and probably impair its operating capabilities. Cost estimates for this restoration are \$62,000-67,000.

A 1902-1908 restoration is the less expensive of the two accurate V&T restoration options. This is basically the condition the locomotive was in when it left the V&T. Again, we have photos of the "Genoa" and her sisters during this time period. Shop records also give a fairly accurate picture of how the locomotive looked. Because the engine is largely in this condition at present, its major artifact value is retained, along with its present operating capabilities. During this time period two different styles of headlights were used. The first was a box headlight, oil burning, and typical of what had been on the locomotive since it was built. The second, applied in late 1903, was an acetylene headlight on a unique stand above the old headlight brackets. If this time period is chosen, a decision should be made as to which headlight style to use. Cost estimates for this restoration period are \$32,000-37,000.

2

By leaving the "Genoa" basically the way it is we have a configuration that never appeared on the Virginia and Truckee railroad. It is, however, the way the locomotive looked in a number of fan trips and exhibitions over the last forty years. The locomotive could be painted as the "Genoa", or it could retain its "Jupiter" paint. It has been the past policy of the California State Railroad Museum to restore equipment to a historical appearance on a working railroad, but the exhibition appearance should be considered with other options. The costs for this approach are nominal.

To summarize, there are two feasible historical restoration options. These are 1873-1878 and 1902-1908. Cost estimates range from \$32,000 to 67,000. There is also the option of leaving the locomotive as it is. An attached chart shows the major component changes required for each historical period. A second chart gives a detailed component analysis. Finally, a report on the recommendation of the restoration research staff is included.

Kyle K. Wyatt

Historical Researcher

California State Railroad Museum

CHRONOLOGY
Virginia & Truckee 4-4-0 #12 "Genoa"
Baldwin Class 8-26C33, Construction No. 3090

August 5, 1872 - Ordered from Baldwin as "Sharon"

December 21, 1872 - Name changed to "Genoa"

January 1873 - Completed by Baldwin

February 17, 1873 - Arrived in Reno

February 26, 1873 - First trip to Virginia City

March 1873 - Lead truck swing increased to that of "Reno" after minor derailments

October 31, 1874 - Locomotive and tender damaged in collision in Reno

November 21, 1874 - Shopping after wreck completed. First V.&T. locomotive with air brakes

June 1892 - New 8-inch air pump added

1898 - ICC safety requirements met

August 1-September 9, 1900 - Rented to Sierra Nevada Wood and Lumber while ex "Bowker" shopped by V.&T.

November 26, 1900 - Rented to Boca & Loyalton Railroad

October 1901-April 1902 - Major rebuild and overhaul in Carson City Shops

November 28, 1903 - New headlight

1906-1908 - Used on Carson-Minden daily mixed

October 1908 - Overhauled in Carson City Shops

December 31, 1908 - Retired, stored in Carson City Shops

June 26, 1912 - Last steamed for ICC hydraulic test

May 17, 1917 - Baldwin estimate for new boiler. Work not done

April 30, 1937 - Retired from accounts. Parts used on "Reno" and "Inyo"

August 18, 1938 - Sold to Eastern Railroad Presidents' Conference

September 2, 1938 - Sale approved by Federal Court

February 24, 1939 - Left V.&T.

4

March 1939 - Overhauled at New Haven R.R. shops, New Haven, Conn., to operating condition, lettered C.P.R.R. No. 60 "Jupiter"

April 29, 1939-October 40 - Operated daily at "Railroads on Parade" pageant at New York World's Fair

October 1940 - Presented to Railway & Locomotive Historical Society

September 21, 1942-June 9, 1948 - Stored with Bath & Hammondsport R.R. in Hammondsport, N.Y.

June 9, 1948 - Shipped to Illinois Central R.R. Chicago Shops for reconditioning to operating condition

Summer 1948 - Operated at Chicago R.R. Fair

November 1948 - Pacific Coast Chapter of R.&L.H.S. acquired care of engine. Shipped to Western Pacific roundhouse, San Jose, California.

May 1, 1949 - Wood fired for excursion of W.P.

May 9, 1949 - Shipped to Chicago on flat car for summer 1949 operation at Chicago Railroad Fair

September 1949 - Shipped to W.P. roundhouse, Portola, California. Restored to V.&T. #12 "Genoa"

November 1, 1949 - Operated at W.P. Ruby Jubilee, Keddie, California

May 1953 - Moved to Reno on W.P.

May 9, 1953 - Operated 3-mile excursion near Reno, returned to storage at Portola

July 1953 - Moved to W.P. Stockton, California, roundhouse

August 21, 1955 - Repainted by Southern Pacific, displayed at Sacramento S.P. Centennial as V.&T. #12 "Genoa"

August 31, 1955 - Operated on Stockton Terminal & Eastern R.R. for Life magazine

October 1955 - Moved to W.P. Oakland, California, roundhouse

October 13, 1955 - Operated 23-mile Oakland-Niles excursion for United Crusade

October 30, 1957 - Operated on San Francisco Embarcadero

May 3, 1964 - Ownership transferred to Pacific Coast Chapter, R.&L.H.S.

August 11, 1964 - Moved to Key System Building

March 6, 1969 - Loaned to S.P., moved to Sacramento Shops. Reconditioned and repainted as C.P.R.R. #60 "Jupiter"

5 5

April 24-27, 1969 - Displayed in Sacramento on Front Street and at S.P. Depot
April 29, 1969 - Trucked to Promontory, Utah, for static display
August 10, 1969 - Conditionally presented to State of California
October 16, 1969 - Trucked to Safeway warehouse in Sacramento for storage
June 30, 1976 - Moved to reconstructed C.P. Depot, Old Sacramento, for display
September 1976-April 1978 - Operated 10 times under steam at C.P. Depot,
Old Sacramento

Recommendation on the Restoration
of the Virginia and Truckee Railroad
Locomotive #12 "Genoa"

Having considered the feasible options available for the restoration of the V&T #12 "Genoa", the restoration research staff recommends that the locomotive be restored to its 1902-1908 appearance. The reasons for this are as follows: First, preserving the present artifact value of the engine. Second, maintaining its operating capabilities. Third, increasing the variety of time period and appearance for interpretation in the Museum. Finally, the great savings in cost and time that this choice will bring over the other feasible historical restoration option.

About 80% of the "Genoa", as it sits, could be reused in a 1902-1908 restoration. By reusing this amount of "original" material, the artifact value of this piece would exceed that of any piece of equipment thus far turned out by the restoration shop. Almost all of the parts that need to be replaced were added after the locomotive left the railroad. We would therefore use almost 100% of the historical parts presently on the engine.

As the locomotive sits, it is in operating condition. In a 1902-1908 restoration we would not change any of these parts, and would thus not effect the engine's operating capabilities.

The Museum will have two locomotives restored to the 1870's that, to the average visitor, will have a very similar appearance in shape and color. By choosing a later time period for the "Genoa" we can add some variety in

appearance for the Museum. The 1902-1908 time period will also give us the opportunity to interpret the changes that a locomotive underwent during its years of service on the railroad.

By choosing the 1902-1908 time period over the 1873-1878 period we will realize an estimated savings of about \$30,000. Additionally, we will save a great deal of time that we have found to be necessary when doing an 1870's restoration.

Based on the above factors, artifact value, operating capabilities, variety for interpretation, and cost and time, the restoration research staff has concluded that the best, and probably most accurate, restoration option for the V&T #12 "Genoa" is the 1902-1908 time period. Therefore, that is our recommendation.

Kyle K. Wyatt

Historical Researcher

California State Railroad Museum

Major Component Changes Needed for
Historical Restoration Options of the
Virginia and Truckee 4-4-2 "2" loco

Component	1873 - 1878	1902 - 1908
Cab	Replace	Rebuild
Smoke Stack	Replace	Replace
Pilot	Replace	Replace
Crosshead Pumps and Injectors	Remove Injectors Add Crosshead Pumps	Use Present Injector
Couplers	Replace	Reuse
Headlight	Replace	Replace
Air Brakes	Remove	Reuse
Smokebox Front	Reuse	Reuse
Boiler Jacket	Replace	Replace
Safety Valves	Replace	Reuse
Firebox Door	Replace	Reuse
Check Valves	Replace one	Reuse
Tender	Rebuild	Reuse

Virginia and Truckee
4-4-0 #12 "Genoa"

	1873 - 1878	1902 - 1908	Present
Boiler	BLW	- -	Stays not drilled
Boiler Lagging	Felt (later wood?)	Asbestos Magnesia	- -
Jacket	Russia Iron	- - (?)	?
Jacket Bands	BLW - 4 formed brass	- -	3 replacements Noseband original
Safety Valves	BLW Balance BLW Locking	Consolidated Safety Valve Co. - Size 2 1902 additions?	- -
Whistle	BLW	- -	g? 1966 replacement
Sanders	Gravity feed	Leach Air Sanders 1908	Brass ball ^{acorn} on sand dome lid missing
Bell	BLW - Style #3	- -	Original stolen 1961-1963 Poor quality replacement 1969
Generator	None	- -	- -
Headlight	BLW box	Acetylene 1903	Inappropriate box
Headlight Platform	BLW	Modified and raised for acetylene headlight 1903	Returned to BLW
Brass Flag Fixtures	BLW on deck	Connecting grab iron between fixtures added 1908	Grab iron removed 1939
Smokebox Front	BLW w/ ⁴ bolts	- -	- -
Stack	BLW Yankee	BLW Sunflower 1902 BLW straight, capped 1908	"Yankee" (?) 1939
Handrails	BLW	- -	Original - acorns missing on bottom of supports
Running Boards	BLW	Notched for air pump	Notch patched 1969
Number Plate	BLW	- -	- -
Builder's Plate	BLW	Date removed ca. 1902	Reproductions w/date
Pilot Braces	BLW	- -	- -
Flag/Lamp Holders	None	- -	- -
Cylinders	BLW	- -	- -
Lead Truck	26" wheels	Rear fenders removed 1902 modified	Front fenders removed? 1908 - 1938 All fenders reinstalled 1939-1940
Drivers	BLW Tires tapered $\frac{3}{16}$ ", 2 $\frac{1}{2}$ " thick	Midvale tires 1901	- -
Driver Fenders	BLW	- -	- -
Pilot Beam	Wood Poling pockets ^{ca} 1880	Wood Poling pockets replaced	- -
Pilot	Iron Rod	Wood Stave 1902 10	Replacement 1939, 1969

	1873-1878	1902-1908	Present
Pilot Coupler	Unrecessed iron bar and rooster	Tower knuckle	Iron bar and rooster replacement 1939
Cab	BLW Walnut w/brass name plate	Painted number replaces painted name 1902. Rebuilt (modified) 1906-1908	— —
Cab Handrails	BLW	— —	— —
Cab Seats	BLW	?	?
Firebox	BLW	— —	— —
Oil Burning Equipment	None	— —	— —
Firebox Door	BLW	VFT Aug. 1902	— —
Ash Pans, Grates	BLW for wood	— —	Removed 1910 Replaced - date?
Steam Gauge	Stamps	Ashcroft 1902	— —
Lubricator	BLW oilers in cab. Nutten hydrostatic Aug. 1889	?	Replacements 1939 and 1969
Backhead Fittings	BLW	Boiler test plate 1908-1912	Whistle lever missing 1 gaugecock missing
Crosshead Pumps Injectors	BLW-2 Injector on right side 1880s	No pumps 2 Monitor #7 injectors 1901	— —
Check Valves	2 BLW Replacement right side below sand dome for injector 1885	BLW original left. Replacement right side moved original location	— —
Hand Brakes	Tender only. Wood, Date? Iron Brake Beams	Wood X	Wood by 1938
Air Brakes	None originally Applied 1874 - 6" pump Updated 1892 - 8" pump	1902 - 9 1/2" pump	90% removed and stored by Southern Pacific in 1969
Tender Under Frame	BLW	?	?
Rear Light	None	— —	— —
Rear Foot Boards & Handrails	probably none	Foot boards on rear 1902-1906 removed 1939 Rear tender grab ca. 1905 - Coupler ca. 1905	— —
Tender Flag & Lamp Holders	None	— —	— —
Tender Steps	BLW	— —	— —
Rear Tender Latching Mechanism	None	Atlas ca. 1902?	— —
Tender Handrails	BLW	— —	— —
Tender Tool Boxes	BLW	— —	Rear box removed by SP in 1961 3 boxes remaining
Tender Tracts & Wheels	BLW Tracts 26" Pace B.T. Highbridge wheels	Tender wheels replaced. Wheels dated: 3 sets Lobloll 1903-1906 1 set Hylor (Highbridge, N.J.) 1914	— —
Tender Tank	BLW - patented 1874 (?)	— —	— —
Tender Apron	BLW	?	Replacement - date?

THE VIRGINIA AND TRUCKEE RAILROAD
Locomotive #12
Genoa

11/89

RESEARCH AND RESTORATION REPORT

by
Annie Grieshop
and
R. H. Denison

Restoration Researchers
and
The Restoration Research Staff

California State Railroad Museum
Department of Parks and Recreation

March 1981

Preface

This is one of the series of reports on equipment being restored by the California State Railroad Museum. It is intended as an in-house document and basically tells what we did and how and why we did it.

We have provided a reasonably shortened history of the Virginia and Truckee Railroad. For more detailed history of this very well-known short line we refer the reader to any of the innumerable books written on the subject.

The restoration research staff is very much indebted to Stephen E. Drew and William Oden who prepared an initial report on this and other pieces of equipment in 1976. We have drawn heavily from their report and from their vast personal knowledge in preparing this report.

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PART I. HISTORICAL PERSPECTIVE

1. THE VIRGINIA & TRUCKEE RAILROAD, 1868-1950

The Virginia & Truckee Railroad Company (V&T) was organized in Nevada on March 5, 1868 to connect Comstock ore-producing mines with quartz reduction mills located along the Carson River, approximately three miles east of Carson City. Surveyed by Isaac E. James, the twenty-one mile standard gauge line between Carson and Virginia City was completed on January 29, 1870. A thirty-one mile extension north from Carson City through Franktown, Washoe City, and Steamboat Springs connected the Comstock with transcontinental rail service at Reno in August 1872.

Primarily controlled by William Ralston, Darius O. Mills, and William Sharon on behalf of the Union Mill & Mining Company and the Bank of California, the V&T was efficiently managed by General Superintendent Henry M. Yerington, and immediately became a paying success. The completion of the railroad permitted the further development of Comstock mines by allowing the economical reduction of lower grade ores through reduced freight rates to the mills and an increased supply of mine timbers and fuel. In addition, well-appointed passenger service to Carson and Virginia Cities was a by-product of the short line's connection with the Central Pacific Railroad at Reno.

For nearly twenty years, the V&T was a major political and economic factor in the growth and development of western Nevada. During the late 1870s, V&T stockholders shared dividends of up to \$90,000 monthly, while additional returns provided the capital for nearly 40 other V&T affiliated concerns. The

300-mile Carson & Colorado Railroad was built from Mound House, Nevada to Keeler, California, and was operated by the principals of the V&T from 1880 to 1900. V&T dividends funded the establishment of Hawthorne, Nevada, the Hawthorne Water Works, lumber operations at Lake Tahoe and southern Nevada, the Columbus Wagon Road to Bodie, a large soda plant at Keeler, and dozens of mining ventures at Aurora, Bodie, Hawthorne, Candelaria, Belleville, Columbus, and Cerro Gordo.

Headquartered at Carson City, a massive complex of railroad shops was erected under the direction of Abraham Curry. The shops were proclaimed by the Central Pacific to be equal to or better than their great locomotive and car building facilities at Sacramento. From these shops poured nearly every conceivable type of essential machinery for communities throughout Nevada, eastern California, and even Mexico. For decades the V&T was hailed as the wealthiest short line railroad in the world.

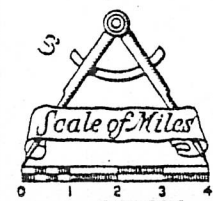
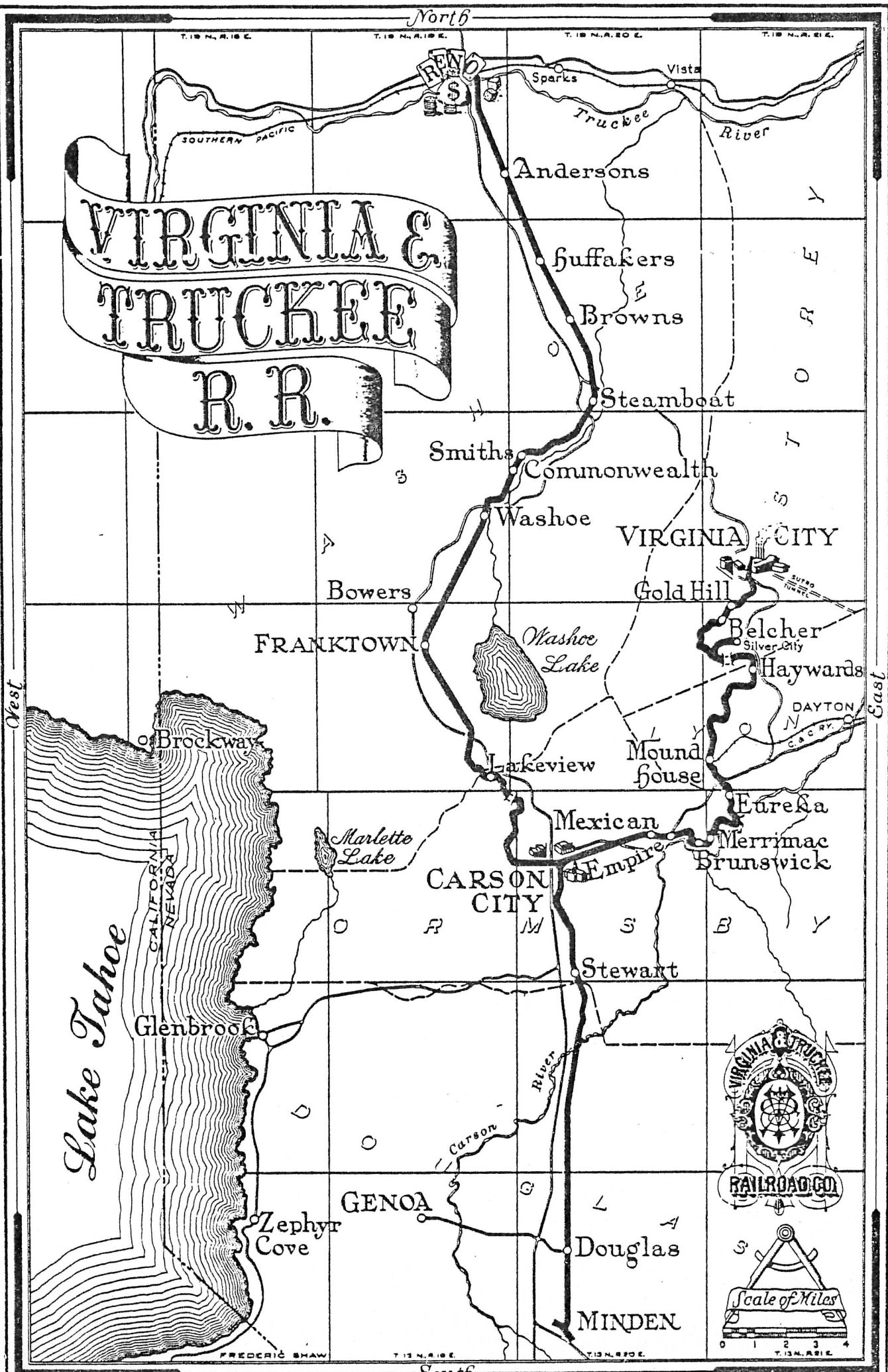
With the revenues derived from the twentieth century Tonopah mining boom, a new Virginia & Truckee Railway Company was incorporated in Nevada on June 14, 1905 to purchase the predecessor company and to construct a fifteen-mile branch south from Carson City to Minden. This branch offered transportation facilities to a growing agricultural and grazing district, and resulted in substantial new revenue to the railway until a highway was constructed between Reno, Carson City, and Minden in 1921-22. Known today as U.S. Highway 395, the concrete highway paralleled the V&T between Reno and Minden, and was the ultimate cause of the railway's red-ink operations beginning in 1923. Prior to that time, the V&T was the only efficient means of freight and passenger transportation between these communities.

During 1932-37, Ogden L. Mills, one of the major stockholders, loaned the railway nearly \$95,000 to balance operating deficits until the line was forced to enter voluntary Federal receivership on April 27, 1938. Solid corporate status was not established again until January 18, 1946, under the financial direction of former V&T Auditor Gordon A. Sampson. Starting in 1937, the railroad began selling capital assets to meet monthly working capital obligations. The disappearance of Comstock traffic and the collapse of several wood-lined tunnels caused the closing of the Carson-Virginia City line in 1938. The rails were removed and sold in 1941, and the resulting \$52,000 revenue was again applied as working capital on routine maintenance which had been deferred for over a decade.

From 1928 to 1947, the V&T had a net income deficit of \$440,605.75 by the accounting practices of the U.S. Interstate Commerce Commission. As early as 1932, officials of the V&T seriously considered total abandonment of the railway in the face of annually mounting losses.

After 80 years of continuous operation, the Virginia & Truckee finally succumbed to the increasing competition of highway truck traffic. The V&T's last official revenue train operated on May 31, 1950 between Reno, Carson City, and Minden. Following the local sale of the railway's structures and properties, the rails between Reno and Minden were finally removed and the famous V&T became only a legend.

VIRGINIA & TRUCKEE R.R.



FREDERIC SHAW

T. 13 N. R. 10 E.

T. 13 N. R. 20 E.

T. 13 N. R. 10 E.

2. VIRGINIA & TRUCKEE LOCOMOTIVE NO. 12, 1873-1938

Virginia & Truckee Railroad Locomotive No. 12, Genoa, is a classic example of the conventional 4-4-0 "American"-type steam engine, the standard locomotive of the American railroad world for nearly three decades. By 1870, over half the locomotives in existence in the United States were of this type. The 4-4-0 wheel arrangement was designed for maximum traction, power, and speed. The light weight and compact nature of the engine made it very flexible for all types of track condition and train operation. The American 4-4-0 rapidly became the symbol of the progress and the industrial strength of the United States in the nineteenth century. Some 25,000 of these locomotives were constructed and operated between 1837 and 1885, but only a few of them remain today.

The Genoa, built in 1872-1873, represents the classic advanced state of the art of American-type steam locomotive construction in its heyday. By 1873, the 4-4-0 had advanced to a mature design with calculated proportions, improved details, a graceful appearance, and an elegance and effectiveness that were to last unchanged for nearly a quarter of a century.

The V&T used the American-type primarily for hauling priority-scheduled through passenger trains between Reno and Virginia City, Nevada. During the lifetime of the V&T, the railroad owned 29 steam locomotives - six of which were passenger-hauling 4-4-0s. Upon the completion of the Reno to Virginia City line in August 1872, the V&T owned only one 4-4-0, No. 11, the Reno, which

was put into service pulling wooden passenger coaches. The 1872 connection of the V&T, with the Central Pacific Railroad at Reno, brought a dramatic increase in passenger traffic, which the Reno was unable to handle alone.

Anticipating the increase in passenger business, another 4-4-0 was ordered from the Baldwin Locomotive Works on July 26, 1872. Ordered as V&T Locomotive No. 12, Sharon, the engine was to be identical to the Reno with minor improvements. The order of the wood burning locomotive was entered by Baldwin in August 3, 1872, as class 8-26 C 33, boiler No. 3090. The class designation 8-26 C 33 was Baldwin's system which indicated "8" for a total of eight wheels under the engine; "26" indicated cylinders 16-inches in diameter; "C" designated four connected driving wheels; and "33" revealed that the locomotive was the thirty-third engine of these exact specifications built by Baldwin.

The practice of naming V&T engines began with the railroad's first locomotive, which was christened the Lyon in 1869. The name was usually applied in raised brass letters on panels on both sides of the cab. The names of the early engines were all geographical place names from Nevada counties, cities, rivers, and communities. Until 1872, the only exception to the geographical name rule was the V&T's 2-4-0 switch engine No. 9, which was named in honor of a local surveyor, Isaac E. James. James and his crew surveyed the route of the V&T and several predecessor roads. It was no doubt to honor the V&T's President, William Sharon, that the new engine was ordered as the Sharon. The name evidently did not meet with Sharon's approval, however, for the name was changed to the "Genoa" in December 1872.

Genoa is the name of the oldest settlement in Nevada. Located approximately 15 miles southwest of Carson City, it was established in 1851. The first printed newspaper in Nevada, the Territorial Enterprise, was founded at Genoa in 1858 and published there until moving to Carson City, and ultimately to Virginia City in 1860.

The "Genoa" was certified for shipment from the Baldwin Locomotive Works in January 1873 and left Philadelphia late in January, together with the V&T's two new freight engines, No. 13, Empire, and No. 14, Esmerelda. The Genoa arrived on the V&T at Reno in February 1873 and was immediately sent to the V&T's Steamboat Springs roundhouse, where final preparations and tests were made prior to revenue service.

Genoa's first run was made in late February 1873. The locomotive performed with efficiency and ease, and a second trip was made the next morning. The only apparent trouble with the engine was its unexpectedly limited pony truck swing, which played havoc with the V&T's tight 18 and 19 degree curves. Following alterations to conform the engine to the successful operating specifications of the Reno, the Genoa worked flawlessly.

The colorfully painted passenger-hauling engine contained a myriad of ornate brass fixtures and fittings, which were the responsibility of the fireman to keep clean and brightly polished. Shop wipers working ten hours a day, six and seven days a week, regularly cleaned and polished the serviceable V&T locomotives each day. Passenger-type locomotives like the Genoa were always brightly painted and received particular grooming attention for daily viewing

by Superintendent Yerington and the traveling public. The pride and efficiency of operation of the V&T was admirably reflected in the immaculate condition in which the passenger-carrying engines were maintained.

For nearly 30 years, the Genoa was a regular passenger, occasional freight, and mixed train hauler. The Reno, Genoa, and Inyo formed the passenger locomotive pool which alternated on the two daily through-express trains between Reno and Virginia City. The regularity and dependability of the V&T trains and their 4-4-0 haulers were regarded as institutions by generations of Nevadans.

The Genoa's first and only major accident likely occurred in October 1874, while approaching Reno with the late evening passenger train from Virginia City. The Territorial Enterprise wrote:

A SMASH-UP.--The passenger train of the Virginia and Truckee Railroad, which left here last Saturday night for Reno, met with quite a serious accident at a point about a mile south of the town named. The train was running at full speed when it struck two flat cars, which some villain unhung had turned loose on a side track and which had run down and stopped across the main track. The two flat cars were completely demolished and the engine and tender of the passenger train were badly used up. Thomas Clark, engineer, and John Webster, fireman, received a number of very painful cuts and bruises, but were not seriously injured. The cuts were from broken glass. The passengers were a good deal shaken up, but fortunately none of them were hurt. The front end of the express car was considerably shattered. The locomotive, the 'Genoa', has been sent to the shop in Carson for repairs.

While in the shop, the Genoa became the first of two V&T locomotives to be outfitted with Westinghouse driving wheel air brakes to augment the manual tender brakes furnished by Baldwin. The job was completed in November 1874, at a cost of \$750 for the locomotive and four passenger cars.

Early V&T engineers liked to operate the Genoa, as it was believed to be the fastest of the railroad's locomotives. For this reason, it saw considerable duty on special picnic, private, and excursion trains. When required for freight service, the Genoa easily handled up to seven loaded short wooden freight cars.

Between 1873 and 1908, the Genoa was generally in constant use unless under repair at the Carson City Shops; even during the Nevada depression years of the 1890s, the Genoa was one of the few locomotives consistently in service. A new eight-inch Westinghouse air pump was installed in June, 1892, and the driving wheel brake assembly was brought up to U.S. Interstate Commerce Commission safety requirements in 1889. ^{typo see p. 48} The lengthy wheel base of the engine and the railroad's numerous curves quickly wore out the forward engine truck and tender wheels and the pilot wheels were frequently replaced. During winter weather, the iron bar pilot was covered with light sheet iron for removing snow from the tracks. Heavy snows required the use of a full engine snow plow and as many as four additional locomotives to get passenger, express, and mail trains through. For their part in operating the Genoa, a typical four-man crew in 1878 earned per day: \$5.00 for the engineer, \$4.00 for the conductor, \$3.50 for the fireman, and \$3.00 for the brakeman. The daily tour of duty was at least 10 hours - quite frequently for seven days per week.

1893
SFD

In 1896, the V&T switch engine No. 21, J. W. Bowker, was sold to the Sierra Nevada Wood & Lumber Co. at Hobart, California, becoming SNW&L Co. Locomotive No. 3. In July 1900, the No. 3 was sent to the Carson Shops for repairs, and the V&T agreed to rent the Genoa to the Hobart line while it was in the shop. From August to September 1900, the Genoa was rented by the SNW&L Co. for \$15.00 per day, with a V&T crew comprised of a machinist and an engineer.

When the new Boca & Loyalton Railroad was under construction at Boca, California in 1900, the Genoa was again briefly rented for \$15.00 per day. No. 12 was soon returned to the V&T Shops, and the switch engine No. 9, I. E. James, was sent over to take its place. The Genoa proved too heavy for the light-weight lumber road and the flanges of the back driving wheels were worn very sharp by excessive use of the engine in running backwards.

From October 1901 to April 1902, the Genoa was completely overhauled, rebuilt, and modified in the Carson City Shops to update the engine for the resurgence of passenger traffic generated by increased mining activity in southern Nevada. The Genoa was the first V&T engine to receive the ICC approved Tower automatic knuckle coupler and 9-1/2 inch Westinghouse air brake system. Prior to the application of Tower drawheads, the Genoa had been used only for connecting with link and pin couplers, Sam's patent draft gear, and the Miller coupling hook. The Baldwin Yankee balloon smoke stack was also replaced with a sunflower stack in 1902. In an effort to conceal the age of their locomotives for safety inspection and valuation purposes, the V&T had the 1873 date of construction removed from the builder's plates. A new acetylene headlight was installed in 1903.

With the opening of the 15 mile V&T branch line from Carson City to Minden in July 1906, the Genoa regularly alternated duty with the Columbus on the daily Carson-Minden mixed train. The engine was last overhauled at the Carson City Shops in October 1908, when air sanders and a cap stack were applied, the cab name panels modified, and the engine completely repainted.

As passenger hauling requirements again declined, the Reno and Inyo were able to handle the greatly reduced volume of passenger traffic, and the Genoa was no longer needed for revenue service by 1909, and was retired to the Carson City Enginehouse. No. 12 was steamed for the last time on the V&T in 1912, when her steam gauge, stay bolts, and safety pops were successfully tested by the ICC inspector to 165 pounds boiler pressure. Between her 1908 overhaul and her retirement, the engine operated only 3,146 miles. Consequently, she was still in prime condition for revenue service, had V&T traffic been significant enough to warrant her continued operation.

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While built at a cost to the V&T of \$14,000 - plus \$1,250 freight charges, approximately \$250 for set up, and \$417 in initial improvements, the Genoa carried an appraised V&T ledger value of only \$8,000 by 1910. Parts from the engine were occasionally appropriated to help keep the Reno and Inyo in service during the 1920s. Her ICC depreciation allowance having expired, the Genoa was officially retired from the V&T's equipment ledger accounts in April 1937 with a final scrap value of \$400.

The Genoa came under violation of minimum ICC boiler safety stress factors in 1923. The V&T management contemplated purchasing a new boiler for the engine and converting her from wood to oil, but declining V&T revenues never

justified the expenditure, estimated by Baldwin at \$3,850 in 1917, and the Genoa avoided reboiling, conversion to fuel oil, and the addition of numerous contemporary, federally-required safety appliances. From 1908 until 1939, the locomotive sat unused in the Carson City Enginehouse. (Note break in color schemes in Appendix A.)

3. VIRGINIA & TRUCKEE LOCOMOTIVE NO. 12, 1938-1979

The Genoa was purchased from the V&T by the Eastern Railroads Presidents' Conference in August 1938 for use in "Railroads on Parade", a pageant at the 1939-40 New York World's Fair. The general director of the pageant was hopeful the engine could be brought up to operating ICC standards at the V&T Shops so it could run under its own power from Carson City to New York; and Master Mechanic Edward C. Peterson was optimistic that the shops could render the engine operable again without completely removing the boiler flues, jacket, or lagging. The ICC, however, refused to certify the engine as operable without a major overhaul to the boiler; and it was ultimately proven to be cheaper to ship the engine aboard two flat cars than to operate it under its own power.

The engine was to be converted to an oil burner with a small 500 gallon tank, an old style box headlight and a balloon stack, and painted and lettered as the Central Pacific Railroad No. 60, "Jupiter", for use in an 1869 gold spike reenactment scene. Following heavy surplus equipment sales to Paramount Pictures, the V&T was unable to furnish an old-style headlight for the locomotive, and the railroad was obliged to manufacture a crude balloon stack. The Genoa, still lettered V&T No. 12, and V&T Combination Car No. 16 were towed with rods down and critical parts boxed from the Carson City shops to Reno in February 1939. From Reno, she was shipped to the New Haven Railroad Shops at New Haven, Connecticut. Here the engine was overhauled to carry working pressure and pass a rigid ICC boiler inspection. A duplicate oil-burning headlight was built, the watertank was cleaned and tested for

leaks, the pony trucks were replaced, new flues were installed, a wood pilot and bonnet stack were supplied, and the locomotive was completely repainted to represent the Central Pacific engine, Jupiter.

During the two fair seasons, from April 1939 to October 1940, the Genoa steamed onto the giant open-air stage at the New York World's Fair. Operated by a Baltimore & Ohio engineer, the locomotive steamed onto the platform to meet a representation of Union Pacific Locomotive No. 119 in the golden spike scene and then back off stage.

In October 1940 at the conclusion of the fair, the Genoa was presented by her owners to the Railway & Locomotive Historical Society, Inc. for preservation, full restoration, operation, and display. The R&LHS was able to secure free covered storage for the Genoa and Combination Car No. 16 in a large Bath & Hammondsport shed at Hammondsport, New York. One report has it that the V&T engine operated on the nine-mile Bath & Hammondsport for four or five days when one of their own locomotives broke down. The operation reportedly caused quite a stir locally, to see an 1873 Baldwin wood-burner still in revenue service. The engine remained at Hammondsport until June 1948, when it was sent to the Illinois Central Railroad Shops at Chicago for reconditioning and subsequent use in another daily gold spike reenactment scene at the 1948 summer season of the Chicago Railroad Fair. Shortly thereafter, the Pacific Coast Chapter of the R&LHS became responsible for the maintenance and housing of the locomotive.

The engine was shipped to California in November 1948 for temporary storage by the Western Pacific Railroad at their San Jose Roundhouse. In May 1949, the Genoa was wood-fired for a San Jose-to-Oakland excursion over the WP for R&LHS members. Eight days later, the Genoa was loaded on a flat car for return to the 1949 season of the Chicago Railroad Fair.

The Genoa left Chicago in September 1949, returning to storage in California at the WP Portola Roundhouse. In November 1949, the engine operated at the WP Ruby Spike Jubilee at Keddie, California; afterwards, it was returned to Portola. At Portola, WP shop forces restored the locomotive to its appearance as V&T No. 12. The Genoa and Combination Car No. 16 were sent to the WP facilities at Reno for operation on a three-mile excursion out of Reno in May 1953. The engine was returned to storage at the Portola Roundhouse and, in July 1953, was moved to the WP Roundhouse at Stockton.

To celebrate the centennial of Southern Pacific Railroad's predecessor company, the Sacramento Valley Railroad, and 100 years of steam railroading in California, SP borrowed the Genoa and completely renewed its V&T paint scheme for display in August 1955 at the Sacramento Passenger Depot. Later in August, the engine operated briefly with Combine No. 16 over the Stockton, Terminal & Eastern Railroad for an article in Life magazine. In October 1955, the Genoa was transferred from Stockton to the WP Oakland Roundhouse where it operated for a 23-mile publicity excursion over the WP with Sierra Railroad Coach No. 6 and a WP gondola for the benefit of the Bay Area United Crusade. The Genoa was steamed for the last time by WP along the San Francisco Embarcadero in October 1957 for an Arthur Godfrey television show.

Ownership of the locomotive was officially transferred from the parent R&LHS to the Society's Pacific Coast Chapter in May 1964. The Genoa was moved to Oakland in August 1964.

Early in 1969, the Southern Pacific Railroad arranged to borrow the Genoa for display in connection with the May 1969 Centennial of the completion of the transcontinental railroad at Promontory, Utah. The SP contacted the Chapter for display of the locomotive at the National Park Service Promontory site, and offered to restore the engine and arrange for its transportation to Utah for the reenactment. The terms of the loan provided for static-display renovation of the engine painted as CPRR No. 60, Jupiter, but without any structural modifications. At the conclusion of SP's use of the locomotive, the railroad agreed to restore the engine once again to its proper V&T Genoa appearance, without any cost to the R&LHS.

In March 1969, the Genoa was trucked to the SP Sacramento Shops for display renovation as the CP Jupiter. The Westinghouse air pump and front number plate were removed, a bell and frame replaced the stolen one, missing cab fittings were supplied, the engine was completely repainted, and all brass components were cleaned and highly polished. The completed engine was displayed in Old Sacramento and, later, at the nearby SP Sacramento Depot before being trucked to Promontory for display through early October. Opposite the Genoa was V&T No. 11, Reno, which the Union Pacific Railroad had borrowed and repainted to represent UP Engine No. 119.

The R&LHS requested that the SP not recondition the Genoa to its original appearance after the Promontory display; they asked that the monies allocated to this project be used in the reconditioning of SP Engine No. 1, C. P. Huntington. The Genoa, therefore, retained her Jupiter appearance until 1979.

The Genoa became part of a collection of historic equipment conditionally presented by the Pacific Coast Chapter to the State of California effective August 1969. This equipment was slated to be displayed in the newly-formulated California State Railroad Museum in Sacramento. In October 1969, the Genoa was trucked from Promontory, Utah to Sacramento, California where it remained in storage until June 1976, when it was moved to the reconstructed Central Pacific Railroad Passenger Station at Old Sacramento for public display.

The locomotive was reconditioned for operation in August 1976 by staff and friends of the California State Railroad Museum. Between August 1976 and June 1979, the engine was steamed several times for both weekend shows and formal occasions. The Genoa appeared as the Jupiter at the dedication of the Passenger Station in September 1976, and as the Genoa at the groundbreaking ceremony for the History Building in April 1978. The change to Genoa appearance consisted of placing a metal plaque with the name Genoa on the cab name board and covering over the name Jupiter on the tender side sheet with red, white, and blue bunting. The engine was also steamed for an orientation movie made in May 1979 for use in the History Building. The name "Jupiter" was painted over for this movie.

The Genoa arrived at the California State Railroad Museum Restoration Shop in June 1979. The restoration on this engine will involve returning it to its circa 1902 appearance as a working V&T locomotive.

II. RESEARCH

1. PHYSICAL RESEARCH

Physical research can be divided in two categories: mechanics and cosmetics. Restoration options are based on several aspects of the locomotive as revealed by the physical research. How will it look by itself and in comparison with other equipment? What level of technological development or railroad history will it portray? And--especially in the case of the Genoa--will it be operational?

All these factors were considered in the restoration of the Genoa. In reality, the restoration options were given before the physical research actually began, but the process will be shown here in reverse to better explain it.

MECHANICAL RESEARCH

Mechanical research is based on the past and present structure and capabilities of the locomotive. As modifications are added over the years, the operational capacity also changes. These changes in turn affect the various restoration options.

Much of this research is accomplished with repair records and photographs; some is done in the process of cosmetic research (see Paint Research). A synopsis from the mechanical maintenance records of the V&T Carson City Shops, March 1888 - December 1903, dealing strictly with the Genoa, is included with

this report. This record is a fine example of the repairs and costs necessary in the maintenance of a working locomotive. A table prepared during the selection of restoration options, comparing the accouterments of the locomotive during various times can be found in Appendix C. Information not found in either of these may be gotten from the "History of the V&T Locomotive No. 12".

Very little actual physical research was done on the mechanics of the locomotive due to the availability of maintenance records. The headlight bracket, pilot deck brace, and tender trucks were checked to determine their age. No decoration was found on the headlight bracket, a V&T replacement. The pilot deck brace showed no paint similar to that in the 1902 photograph (white in the middle, black on the ends). The tender truck frame cross-members were stripped to determine the serial numbers of the trucks. The front truck was stamped with "27-1/2C350", the serial number of V&T No. 11, Reno. The back truck had no serial number and is considered to be a replacement.

The cosmetic research done on the Genoa is discussed in Paint Research. Much information relating to mechanical research was uncovered in the paint research, e.g., the replacement of the cab. A short section dealing with Paint Research Techniques is also included.

RECORD OF REPAIR AND MAINTENANCE V&T #12 (Genoa)

FROM V&T MASTER MECHANIC ACCOUNT BOOK, March, 1888 to December 1903

V&T LOCOMOTIVE NO. 12, GENOA

6/88: 1 throttle lever; 2 brass collars for truck axles
7/88: 1 air pump valve, 50¢; cast iron collars; candles
8/5 and 1 double sight feed lubricator; brasses; 2 driving boxes; brass
8/14/89: steam gauge bracket, 120 lbs., 1/4" iron
9/13/89: 3 pair 26" tender wheels: 4 new wheels, 2 new axles, 2
 reground wheels, 1 old axle
 (2 new wheels and 1 axle cost \$59.50)
9/20/89: 6 tender brasses; 4 brake shoes; 1 steam chest, 154 lbs.; 1
 cast iron driving box saddle; candles
9/30/89: Baldwin Passenger in service
9/90: 2 brake shoes; 2 pair 26" tender wheels
2/91: iron; brass; candles
6/91: 1 pair engine truck wheels; new axle
6/92: 1 new 8" automatic air pump complete, 8" cylinder and all
 connections, \$350.00
2/93: 1 rod cup; 1 refilled tender brass cup, \$1.25
3/93: 1 main rod cup, \$1.50; tender brass
8/93: 2 new collar pins; 1 grate bar casting, 63 lbs.; candles
1/94 1 cab bracket, 102 lbs.; 1 tank step, 47 lbs.; 2 tank corner
 plates, 38 lbs.; feed pipe hangers; 2 tank boxes, covers, and
 brasses; 1 pair 26" wheels
4/94: 1 paste cup repair, 75¢
12/94: 2 pair 26" tender wheels' 4 tender brasses
9/95: 2-1/4" air hoses, \$1.25 each; 6 candles

10/96: 1 repaired tender spring; 2 brake shoes
 11/96: 1 piece air hose; 2 paste cup repairs; 1 tender oil box; candles
 12/96: 6 brake shoes; 2 hanger pins; 2 pair 26" engine truck wheels,
 \$76.00; 2 brass stuffing box rings
 1/97: 1 tender brass; 1 cast iron water tank nut, 31¢; 4 piston snap
 rings; candles
 2/97: 2 new air hoses, \$1.25 each; candles
 9/97: 1 tank hose, \$1.50
 12/97: 3'2" - 2-1/2" tank hose; candles
 5/98: 2 snap rings; 12 - 1" hex nuts; candles
 11/98: 2 tank brasses; brass; candles
 12/98: 1 pair new 26" tender wheels; WILY, \$36.00
 2/99: 6 refilled tender brasses; 1 cast iron tank box cover, 3 lbs.
 3/99: 2 air pump valves, \$1.00; brass bushing; cast iron snap ring
 for air pump; 2 pair 26" tender wheels, \$34.00/pr.; 1 pair 26"
 engine truck wheels, \$36.00
 4/99: 2 refilled tank brasses; 1 pair 26" tender wheels N.W.N.A.
 \$52.00
 6/99: 1 cast iron cone, 137 lbs., \$8.22
 9/01: 1 set rod and driving box brasses
 10/01: 2 piston rod shells and glands; brasses; 2 valve stem shells
 and glands; 2 balance valve discs; 2 cast iron piston glands;
 valve stems; check elbows; 4 flanged steel tires, 4,298 lbs.,
 \$322.35; bull rings
 11/01: 8 cast iron crosshead plates; 1 snap ring casting; 1 full set
 rod brasses, 132 lbs.; candles; 1 No. 7 monitor injectors
 12/01: 1 new right hand injector check; 1 sheet No. 10 iron, 218 lbs.

2/02: 1 cast iron cab plate; 1 - 9-1/2" air pump: Schedule A1 & B1 complete, no price; candles; 2 Tower couplers, \$48.48
(first V&T engine equipped with Towers and larger, 9-1/2", air pump)

2/02: 9-1/2" Westinghouse Automatic Air Pump, \$155.98; brass hose connections feed pipe; 1 new Ashcroft steam gauge, \$12.00; 1 set new grate bars, 438 lbs.; 1 tender center casting, 257 lbs.; 1 tender box oil; bolt; tender wedge; 8 cast iron washers; 7 brake head pins; binder bolt; 2 refilled tender brasses; 9 split keys; 1 set magnesia lagging for boiler, \$70.00; 1,584' - 2" tubes, 11' long \$364.32; 70 lb. Russia iron

3/02: 1 new smoke stack, 225 lbs., No. 14 iron, \$11.25; 1 cast iron smoke stack saddle, 243 lbs., \$12.15; 1 cast iron smoke stack ring, 97 lbs., \$4.85; 70 lbs. No. 12 iron, \$3.50; 14' spark wire netting, \$8.40; 1 pair 26" tender wheels W.W.N.A. painted

6/02: 84 lbs. No 14 iron; 2 new tender brasses; 4 oil cups; piston and valve stems

8/02: 1 new fire box door, ring, and liner, 108 lbs., \$5.40

9/02: 3 refilled tender brasses

10/02: lubricator wood handle; 2 new tender brasses, 150 lbs.; 3/16" iron

11/02: 1 wedge bolt; 1 pair 26" engine truck wheels

12/02: 2 refilled tender brasses; 2 tender brake shoes

1/03: 2 cast iron wedges; 2 tender brake shoes; 8 refilled tender brasses

2/03: 2 driving brake shoes, 31 lbs. each; 1 repaired rod cup; 1 tender brake shoe; 1 brass bushing for valve stem

4/03: 3 tender brake shoes
 6/03: 2 tender brake shoes
 7/03: 1 coupling lever casting, 10 lbs.; 12' locomotive spark wire
 netting; candles
 8/03: 1 engine pony truck spring
 9/03: 2 tender brake shoes; 1 valve stem bushing; 2 new tender brasses
 10/03: 2 brake hanger clutches; 2 tender brake shoes; 2 pair 26"
 engine truck wheels
 11/03: 1 driver brake shoe, 30 lbs.; 1 old tender spring; 5 lbs. brass
 for steam chest cover; 1 new headlight, \$30
 12/03: 2 driving wheel brake shoes; 4 tender brake shoes

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American Brake Co., Westinghouse Co. Lessee

St. Louis, MO.

Engine Driving Wheel Brakes - 1898

Smith Shop Material	\$ 10.40
Smith Shop Labor	27.90
Tin Shop Material	16.98
Tin Shop Labor	11.60
Machine Shop	<u>90.00</u>
	\$ 156.88

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1900: B. and L. Co., Boca, California

November 9, 1900, Engine No. 12 rented to the Loyalton Wood and Lumber Co. @\$15.00/day commencing Nov. 9, 7 o'clock A.M.
I. N. Fording, M.M.

November 26, 1900, Engine No 12, Genoa, returned by the Loyalton Wood and Lumber Co. from Boca, California

November 27, 1900, Engine No. 9, I. E. James, taken over to Boca to replace Engine No. 12, which weighed too much for new track now under construction. Also, flanges of back driving wheels were being worn very sharp owing to the engine doing considerable work by running backwards.

Supplies sent over to the Loyalton Wood and Lumber Co.

5 gal. cylinder oil

20 lbs. waste

4 tender brasses

from S. E. Drew Collection

PAINT RESEARCH TECHNIQUES

Paint research was done in accordance with methods previously developed by Penelope H. Batcheler in 1963 and explained in her article "Paint Color Research and Restoration", published in the Technical Leaflet series of the American Association for State and Local History and modified by the CSRM research staff. This technique involves "cutting" a narrow area of paint with sandpaper or a scalpel, identifying layers, and sanding a larger area to verify and match the colors and decorations.¹

A small representative area of the larger area to be checked is cut from present paint to base material and smoothed for layer identification. The cutting is done with an Exacto knife or with 220-grit "wet or dry" sandpaper and a light lubricating oil. Once the base material has been exposed, the cut is sanded with 220/400/600-grit "wet or dry" sandpaper and oil to widen and smooth the layers. Widening the paint layers aids in determining colors, thickness of paint layers, layers of varnish (to differentiate final paint from primers), and layers having decorations.

Paint colors are identified and matched with colors found in Pantone, Dunn-Edwards, or other paint-matching systems. The colors are then listed on paint charts with identification by number and paint chips.

Areas found to have decorations are sanded with 400/600-grit sandpaper, taking care to expose as much as possible of only one layer at a time. Tracings of these decorations are taken on acetate film, noting position, sizes, and colors. These tracings are then used to develop paint schemes in restoration.

PAINT RESEARCH

Paint research on the Genoa was begun in January 1979. Samples of paint were taken in more than 50 areas on the engine and tender. The general results of the sampling are given in the Paint Correlations (see Appendix B). More specific information on paint colors and applications can be found in the paint records, but the correlations represent possible basic schemes used by the V&T and others responsible for paint on the Genoa.

The following are clarifying notes on the paint research and explanations of the paint correlations.

In general, the correlations were obtained by cross-references among paint samples from the Genoa, photographs of the Genoa and other V&T locomotives, and past research on other V&T locomotives.² They are not presumed to be a definitive paint chronology but, rather, a general base to be expanded as more evidence comes to light.

The cab of the Genoa appears to have been replaced, probably in late 1874.

The reasons are:

- 1) The cab was ordered built of solid walnut, whereas the present cab is built entirely of oak, using walnut only for molding, side panels, sashes, and alternate roof boards.
- 2) No builder's number was found on the inner front wall of the cab, a common practice of BLW³
- 3) The locomotive was involved in a major collision in October 1874, which apparently destroyed much of the cab.⁴
- 4) The later paint layers on the cab correspond quite well with those found on other areas of the engine, suggesting that the cab was replaced early in her career.

It is possible that some parts of the original cab were used in the replacement but, if so, the amount is unknown. The appearance of the original cab is also unknown, but was probably similar to that used in 1874, as V&T painters copied other BLW designs, e.g., that on the sand box cover, for several years.

The drivers and tender appear to have been stripped during the 1901 shopping. The drivers were re-tired -- a process which usually destroys most of the paint on the drivers. The drivers and the tender were both primed with an orange-brown paint, a slightly lighter shade than that found on the rest of the locomotive.

The oldest layer of paint on the sand box is probably builder's paint. Between this and the second layer (identical in design and color) is patchy white paint that appears to have been applied in repair of the 1874 collision. The V&T retained the standard Baldwin paint design on the sand box, probably into the 1880s. The sand box was not primed during the 1902 rebuild.

The tender was found to have only two layers of paint under the circa 1901 layer. Both these layers were very patchy, indicating extensive sanding. The time placement of these layers is unknown, but is probably post-1874. The exact amount of damage done in the 1874 collision is unknown, but was probably fairly severe, judging from reports.⁵ If so, previous paint could have been destroyed in the repair process or during the 1902 shopping.

The dates assigned to the various paint layers are based mainly on photographs of the Genoa and other V&T equipment. The decorations shown in these photographs were correlated to obtain general dates for the various styles (see Appendix A). These date and style correlations are:

ca. 1876-1884	engine - GENOA on side panel tender - V&T R.R. in BLW or V&T Styles
ca. 1884-1885	engine - GENOA on side panel tender - not determined
ca. 1886-1890	engine - GENOA on side panel tender - VIRGINIA & TRUCKEE in "Railroad" Roman Style - "V" and "T" larger than other letters
ca. 1890-1907	engine - 12 on side panel tender - VIRGINIA & TRUCKEE in "Railroad" Roman Style
ca. 1908	engine - 12 on side panel tender - VIRGINIA & TRUCKEE in Gothic Style

The paint layers found on the Genoa seem to correspond with this chronology for the most part. The "Genoa's" were found on the cab side panel, on wood or lake paint. There was no clear decoration found on the earliest black or lake

layers on the tender; but traces of red striping and gold leaf were found, pointing to decorations that have been destroyed. The brown paint on the drivers, tender, cab, and steam dome cover are primers.

The next layer, black with yellow lettering, appears to have been applied ca. 1886. The tender evidenced two sizes of lettering, the later applied directly over the earlier, with no intervening base layer. The differences were in the "V" and "T", being larger in the ca. 1885 lettering than in the 1890-1907 lettering where all letters were the same height.

Directly over this layer, with no intervening base layer, is aluminum leaf lettering.⁶ This lettering is assigned to the 1905 era.

The next layer, black with lettering of unknown color, is probably from 1908, as previously noted. This layer survived until 1939 when the Genoa was sold by the V&T.

Paint applied post-1939 can be identified and correlated with photographs. Because of this, little will be said of paint, 1939-1979. A Paint Correlation, 1939-1979 can be found in Appendix A. This, together with the Genoa chronology (see Appendix B), will give the necessary information.

PAINT RESEARCH

FOOTNOTES

1. For more detail on research methods used by the CSRM research staff, see: Sharon L. Edaburn, "The Monterey & Salinas Valley Railroad: Combination Car No. 1", p. 47. (CSRM report, 1978)
2. See other CSRM Reports; also, unpublished paint correlations on V&T 18, Dayton, prepared by R. G. Steiner, former CSRM staff member, for Nevada State Railroad Museum, 1979.
3. Richard N. Katz, "The North Pacific Coast Railroad: Locomotive #12, 'Sonoma'," (CSRM Report, 1979) p. 13.
4. Territorial Enterprise, November 3, 1874.
5. Ibid.
6. See Appendix A for analysis of "silver" paint sample.

2. RESTORATION OPTIONS

The following recommendation on restoration options was prepared in January 1979 for submission to the curatorial staff of the CSRM. The recommendation was accepted as submitted, and the Genoa was restored to her 1902 appearance.

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"Having considered the feasible options available for the restoration of the V&T #12, Genoa, the restoration research staff recommends that the locomotive be restored to her 1902-1908 appearance. The reasons for this are as follows:

- 1) to preserve the present artifact value of the engine.
- 2) to maintain her operating capabilities.
- 3) to increase the variety of time period and appearance for interpretation in the Museum.
- 4) to take advantage of the great savings in cost and time that this choice will bring over the other feasible historical restoration option.

"About 80 percent of the Genoa, as she sits, could be reused in a 1902-1908 restoration. By reusing this amount of "original" material, the artifact value of this piece would exceed that of any piece of equipment thus far completed by the restoration shop. Almost all of the equipment that needs to be replaced was added after the locomotive left the V&T. We would, therefore, use almost 100 percent of the historical equipment presently on the engine.

"The locomotive, as she sits, is in operating condition. In a 1902-1908 restoration, none of the present equipment would be changed, and would, therefore, not affect the engine's operating capabilities.

"The Museum will have two locomotives restored to the 1870s which, to the average visitor, will have a very similar appearance in shape and color. By choosing a later time period for the Genoa, we can add some variety in appearance to the Museum. The 1902-1908 time period will also give us the opportunity to interpret the changes a locomotive underwent during her years of service on the railroad.

"By choosing the 1902-1908 time period over the 1873-1878 period, we will realize an estimated savings of \$30,000. Additionally, we will save a great deal of time which has been found to be necessary when doing an 1870s restoration.

"Based on the above factors - artifact value, operating capabilities, variety for interpretation, and cost - the restoration research staff has concluded that the best, and probably most accurate, restoration option for the Genoa is the 1902-1908 time period."

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Charts were also prepared detailing the major component changes needed on the Genoa for historical restoration to various periods. These charts reconfirm the decision for restoration to the 1902-1908 era, and can be found in Appendix C.

III. RESTORATION

1. REPAIR AND RESTORATION

The Genoa went into the restoration shop in June 1979. With the earlier decision to restore the Genoa to its 1902 appearance, the actual locomotive and historical data for the selected date were correlated to determine parts to be removed or replaced.

The boiler jacket was removed, the exterior of the boiler stripped of lagging, and then cleaned and painted with a rust inhibiting primer. The jacket material was "Russia iron" with a name in the Cyrillic alphabet stamped into each major sheet. This may be an inspector's or maker's stamp. (The research report on the North Pacific Coast, narrow gauge, Locomotive No. 12, "Sonoma", has a write-up relative to the history, manufacture, and characteristics of "Russia iron".)

Unfortunately, the jacketing was so rusted away that it had to be replaced. The new jacket material is 20 gauge galvanized sheet iron, painted with Dupont's Dulux Automotive Enamel, metallic charcoal 4980D to which was added iron blue tinting pigment 3D to suit (approximately one quart pigment to four gallons of the paint) to simulate the original "Russia iron". Original brass bands were also used. The original boiler lagging was reused.

The pilot was replaced with a newly constructed wood stave pilot made of oak with iron face reinforcing. The front coupler pocket was remounted equipped with an original style "Tower" knuckle coupler.

A new wood lamp shelf was made for the headlamp and attached to the headlight support bracket. A new "Sunflower" style smoke stack was installed. This stack was fabricated in the Museum Restoration Shop.

Extensive brass work was done. In the absence of proper fittings and parts for the 1902 period, a new bell was cast, a brass bell bracket turned, a flow bowl spun, lubricator cups turned, blow down cock fabricated, and other numerous small parts made.

Since the proper authentic headlamp could not be located, the restoration shop prepared a steel forming die so that the sheet metal sides of the lamps could be formed and then completed the headlamp with the exception of the reflectors. To obtain these, it was necessary to go to commercial concerns capable of spinning the 22" diameter reflector.

During the restoration process, research was continued as parts were removed and new surfaces exposed. There were no new or unusual discoveries made. Extensive paint research was done on the sand dome where the paint was thick in hopes of locating decorative striping that would have been unique to the Virginia and Truckee. None were discovered and only the normal Baldwin patterns of striping with diamond spear paint was found. However, these had been modified by the V&T as to stripe width and color.

As work progressed on the external engine, the firebox, boiler tubes, and smoke box were cleaned and inspected. In anticipation of future running, the boiler was hydrostatically tested at 165 psi. No leaks were evident. Stay bolts were hammer tested and found to be sound.

As metal fabrication continued, the woodworking shop was also playing its part in the restoration. In addition to the previously mentioned headlamp shelf and pilot, new runningboards were installed and the cab was cleaned, moulding repaired and replaced, and square ends of the name panel replaced with round ones proper for the 1902 period. After removal of the tender tank from the frame, rotted wood in the tender platform was removed, which permitted a thorough examination of the wood frame and brake gear and trucks. This examination showed it necessary to replace the compression beam and intermediate sills and the forward end sill. The tie rod tension members were loosened, permitting the frame members to be removed. New wood was prepared with mortise and tenon joints and installed into the tender frame. After completion, a new wood deck was applied.

The tender tank required extensive repair to continue in service on a working locomotive. The badly rusted bottom sheet was torch cut from the tank sides. After cleaning rust and scale from inside the tank and a new bottom welded in, a coating of epoxy resin was added to insure a leak and corrosion resistant tank. The water valves and seats were remachined and installed.

With the completion of the work on the interior of the tank, it was returned to the tender frame, primed, and given a coating of "Bondo" to fill pits and

other indentations. After drying, this coating was extensively sanded to provide a smooth base for painting. Wood racks were also added to allow additional wood being stacked on the tender. New tool boxes were added.

Brake gear and trucks were removed, cleaned, checked for serviceability, primed and painted, and reinstalled.

After all other restoration was completed, the locomotive was given its final finish of gloss black with polished brass fittings, a boiler jacket of simulated "Russia iron" and its number "12" in imitation gold shaded in red. The "Virginia & Truckee" lettering on the tender is also imitation gold with red and maroon shading. Cylinder and valve covers are polished brass.

In its 1902 appearance, the Genoa will be a marked contrast to the "Sonoma" and "Empire" in their 1870s real gold leaf and ornate striping. In this span of 30 years, the locomotive changed from a near work of art to an austere and usually all black working engine.

APPENDIX A

PAINT CORRELATIONS & ANALYSES

V. & T. #12 --- 19_ 1955 COLOR SCHEMES

YEAR	CAB	CAB PANEL	CAB SIDE SHEET	CAB BRACKET	DRIVERS	STEAM DOME	SAND BOX	TENDER
939	BRICK RED	Red w/ Gold "Jupiter" 2-tone Green Shadowing	BLACK	BLACK	Red w/ Gold Stripe (on ctrwgt) & Chain (on hub)	BRICK RED	BRICK RED	Brick Red on whole tender 'till 1969, Red w/ Gold Leaf "Jupiter" on center of side sheet
948	BRICK RED	Red w/ Gold Leaf "Jupiter" & Green Shadow	BLACK	BLACK		BRICK RED	BRICK RED	Red w/Gold Leaf "Jupiter" on side sheet
949	BRICK RED	Red w/ Gold Leaf "Genoa" & Black Shadow	BLACK	BLACK	Brick Red w/ Gold Leaf Stripe (on ctrwgt) & Chain (on hub)	BROWN	BROWN	Red w/Gold Leaf "Genoa" on side sheet
955	BRICK RED	Brick Red w/ Gold "Genoa" & Black Shadow	BLACK	BLACK	Red w/ Gold Leaf Stripes (on ctrwgt & hub) and Star w/ Black Shadow (on axle)			

V. & T. #12 --- 1955-1979 COLOR SCHEMES

YEAR	CAB	CAB PANEL	CAB SIDE SHEET	CAB BRACKET	DRIVERS	STEAM DOME	SAND BOX	TENDER
955	BRICK RED	Brick Red w/ Gold "Genoa" & Black Shadow	BLACK	BLACK	Red w/ Gold Leaf Stripes (on ctrwgt & hub) and Star w/ Black Shadow (on axle)			
969	BRICK RED	Red w/ Gold "Jupiter" & Black Shadow	BLACK	BLACK	Red w/ White Star (on axle)	BRICK RED	BRICK RED	Brown on whole tender through 1979, Brick Red w/ Gold "Genoa" on center of side sheet
979		Metal Plaque "Genoa"						Brick Red on center of side sheet

V. & T. #12 --- 1903-1902 COLOR SCHEMES

YEAR	CAB WALLS	CAB MOLDING	CAB PANEL	CAB SIDE SHEET	CAB BRACKET	DRIVERS	STEAM DOME	SAND BOX	TENDER
1873	UNKNOWN (Walnut)	UNKNOWN (Walnut)	UNKNOWN (Walnut)	Lake w/ Red & White Striping	(lt. side only 'till 1894) Lake w/ Red & White Str.	UNKNOWN (Stripped)	UNKNOWN (Stripped)	Lake w/ Gold Leaf, Green, White	UNKNOWN
1874	OAK	WALNUT w/ Gold Leaf Striping	WALNUT w/ Gold Leaf "Genoa" & 2-tone Green Shadowing	Lake w/ Red & White Striping (rt. side only)				Lake w/ Gold Leaf, Green, White	UNKNOWN
	LAKE	White w/ Gold Leaf Striping	Lake w/ Gold Leaf "Genoa" & 2-tone Red Shadowing	Lake w/ White & Yellow Str.	Lake w/ White & Yellow Striping			Lake w/Gold Leaf, Red, Green & White	Black, w/ Orange Striping
		Lake w/ White Striping	Lake w/ Gold Leaf "Genoa" & 2-tone Green Shadowing	Lake w/ White & Yellow Striping					Lake w/ Gold Leaf
	LAKE	Lake w/ White & Yellow Striping		Lake w/ White & Yellow Striping	LAKE			Lake w/ Cream, Red, Green, & White	
1901	BROWN (Primer)	BROWN (Primer)	BROWN (Primer)	BLACK	BLACK	ORANGE- BROWN (Primer)	BROWN (Primer)	UNKNOWN (Not Primed)	ORANGE- BROWN (Primer)
1902	BLACK	BLACK	Black w/ Yellow "12" (R.R. Roman)	BLACK	BLACK (rt. side replaced, '94)	Red w/ Dupont #51078 Black Stripe (on hub & spokes)	BLACK	BLACK	Black w/ Yellow "12" & "VIRGINIA & TRUCKEE" (R.R. Roman)

V. & T. #12 --- 1902-1908 COLOR SCHEMES

YEAR	CAB WALLS	CAB MOLDING	CAB PANEL	CAB SIDE SHEET	CAB BRACKET	DRIVERS	STEAM DOME	SAND BOX	TENDER
1902	BLACK	BLACK	Black w/ Yellow "12" (R.R. Roman)	BLACK	BLACK (rt. side replaced, '94)	Red w/ Dupont #51078 Black Stripe (on hub & spokes)	BLACK	BLACK	Black w/ Yellow "12" & "VIRGINIA & TRUCKEE" (R.R. Roman)
1905			Aluminum Leaf "12" (R.R. Roman)			BLACK			Aluminum Leaf "12" & "VIRGINIA & TRUCKEE" (R.R. Roman)
1908	BLACK	BLACK	Black w/ "12" (Gothic)	BLACK	BLACK		BLACK	BLACK	Black w/ "VIRGINIA & TRUCKEE" (Gothic)

V&T LETTERING STYLES, 1876-1908
FROM ALL PHOTO DATA ALL LOCOMOTIVES

- 1876: Engine - NAME on side panel (TAHOE, TRUCKEE, HUMBOLDT)
Tender - V&T R.R. - Baldwin Style
- 1880: Engine - NAME on side panel (GENOA)
Tender - V&T R.R. - V&T Style
- 1884- Engine - NAME on side panel (RENO)
1885: Tender - not determined
- 1886: Engine - NAME on side panel (VIRGINIA)
Tender - V&T R.R.
- ca. 1890s: Engine - NAME on side panel (INYO)
Tender - VIRGINIA & TRUCKEE
(LETTERS "V" and "T" larger than remaining letters)
- 1902: Engine - number on side panel (12)
Tender - VIRGINIA & TRUCKEE - Railroad Roman
(yellow with shadow)

APPENDIX A

1905: Engine - number on side panel (17)
 Tender - VIRGINIA & TRUCKEE - Railroad Roman
 (aluminum with no shadow)

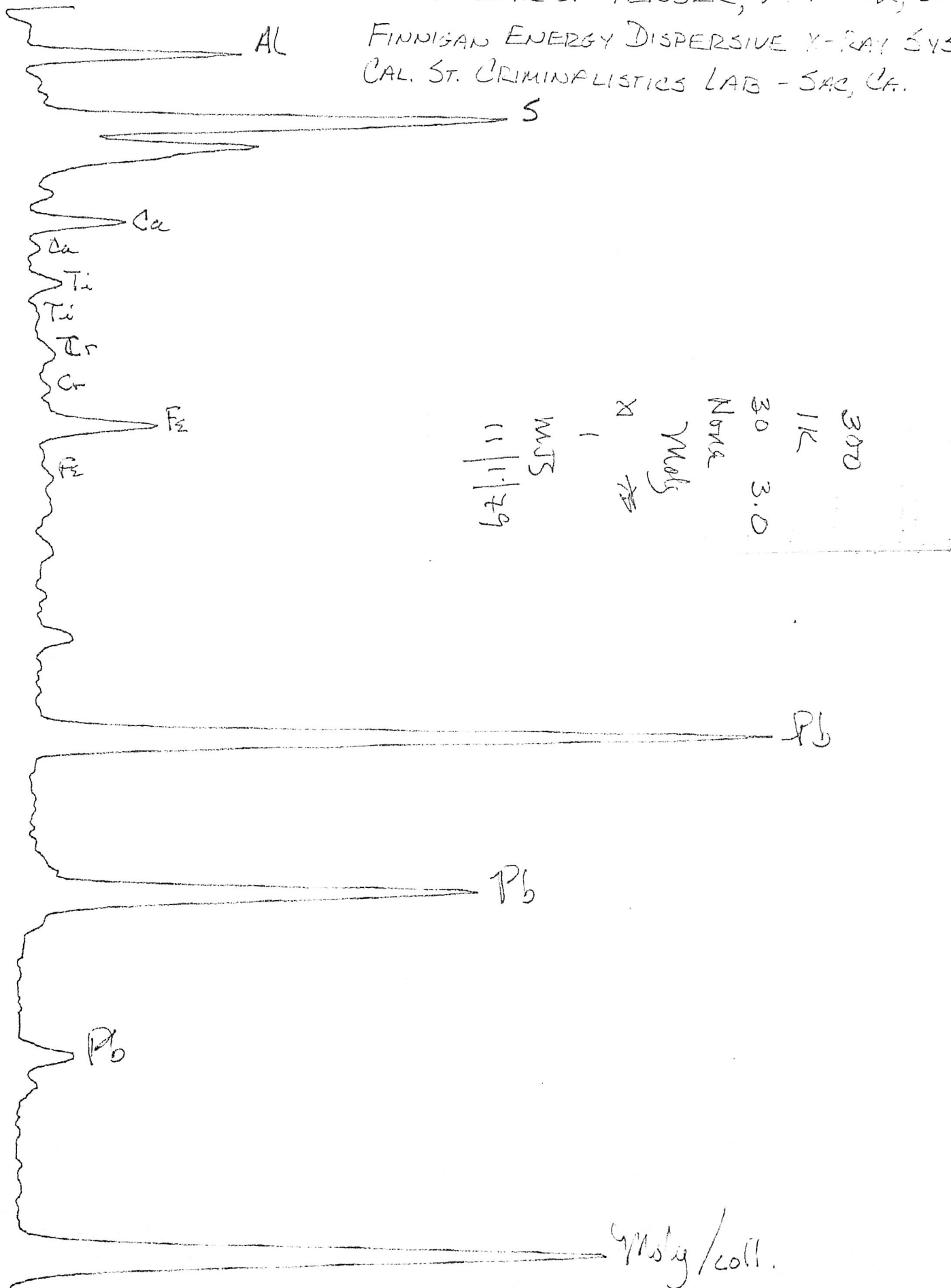
1908: Engine - number on side panel (12, 13)
 Tender - VIRGINIA & TRUCKEE - Gothic
 (aluminum with no shadow)

Information taken from Old Virginia & Truckee Loco Photos collection of the
CSRM research photographs and in CSRM Archives.

APPENDIX A

Chemical Analysis of Aluminum Paint Sample

RESULTS OF SAMPLE OF "SILVER" LEAF
 FROM REAR OF TENDER, V#T #12, 32.1952
 FINNIGAN ENERGY DISPERSIVE X-RAY SYSTEM
 CAL. ST. CRIMINALISTICS LAB - SAC, CA.



QUALITATIVE, NOT QUANTITATIVE, ANALYSIS - MAIN ELEMENTS:

APPENDIX B

CHRONOLOGY

CHRONOLOGY --- GENOA

- August 5, 1872 - Ordered from Baldwin Locomotive Works as "Sharon".
- December 21, 1872 - Name changed to "Genoa".
- January 1873 - Completed by Baldwin.
- February 17, 1873 - Arrived in Reno.
- February 26, 1873 - First run to Virginia City.
- March 1873 - Lead truck swing increased to that of "Reno" after minor derailments.
- October 31, 1874 - Locomotive and tender damaged in collision in Reno.
- November 21, 1874 - Shopping completed after collision. First V&T locomotive with air brakes.
- June 1892 - New 8-inch air pump added.
- 1898 - ICC safety requirements met.
- August 1 -
- September 9, 1900 - Rented to Sierra Nevada Wood and Lumber while ex-"Bowker" shopped by V&T.
- November 9-26, 1900 - Rented to Boca & Loyalton Railroad.
- October 1901 -
- April 1902 - Major rebuild and overhaul in Carson City Shops.
- November 28, 1903 - New acetylene headlight.
- 1906-1908 - Used on Carson City-Minden daily mixed.
- October 1908 - Overhauled in Carson City Shops.
- December 31, 1908 - Retired, stored in Carson City Shops.
- June 25, 1912 - Last steamed for ICC hydrostatic test.
- May 17, 1917 - Baldwin estimate for new boiler. Work not done.

April 30, 1937 - Retired from V&T account books. Parts used on "Reno" and "Inyo".

August 18, 1938 - Sold to Eastern Railroad Presidents' Conference.

September 2, 1938 - Sale approved by Federal Court.

February 24, 1939 - Left V&T.

March 1939 - Overhauled at New Haven R.R. Shops, New Haven, CT, to operating condition; lettered CPRR No. 60, "Jupiter".

April 29, 1939 -

October 1940 - Operated daily at "Railroads on Parade" pageant at New York World's Fair, summers only.

October 1940 - Presented to Railway & Locomotive Historical Society for restoration.

September 21, 1942-

June 9, 1948 - Stored with Bath & Hammondsport R.R. at Hammondsport, NY.

June 9, 1948 - Shipped to Illinois Central R.R. Chicago Shops for reconditioning to operating condition.

Summer 1948 - Operated at Chicago Railroad Fair.

November 1948 - Pacific Coast Chapter R&LHS acquired care of engine. Shipped to Western Pacific Roundhouse, San Jose, California.

May 1, 1949 - Wood fired for WP excursion.

May 9, 1949 - Shipped to Chicago on flat car for summer 1949 operation at Chicago Railroad Fair.

September 1949 - Shipped to WP Roundhouse, Portola, CA.

November 1, 1949 - Operated at WP Ruby Jubilee, Keddie, CA.

November 1949 - Returned to Portola Roundhouse. Restored to V&T Genoa.

May 1953 - Moved to Reno on WP.

May 9, 1953 - Operated three-mile excursion near Reno for Ninth Pacific Coast Region National Model Railroad Association on Convention. Returned to Portola Roundhouse.

July 1953 - Moved to WP Stockton (CA) Roundhouse.

August 21, 1955 - Repainted by Southern Pacific, displayed at Sacramento SP Centennial as V&T Genoa.

August 31, 1955 - Operated on Stockton Terminal & Eastern R.R. for Life magazine.

October 1955 - Moved to WP Oakland Roundhouse.

October 13, 1955 - Operated 23-mile Oakland-Niles excursion for United Crusade.

October 30, 1957 - Operated on San Francisco Embarcadero for Arthur Godfrey show.

May 3, 1964 - Ownership transferred to Pacific Coast Chapter, R&LHS.

August 11, 1964 - Moved to Key System Building, Oakland, CA.

March 6, 1969 - Loaned to SP; moved to Sacramento Shops. Reconditioned and repainted as CPRR No. 60, Jupiter.

April 24-27, 1969 - Displayed in Sacramento on Front Street and at SP Depot.

April 29, 1969 - Trucked to Promontory, Utah for static display at Centennial of transcontinental completion.

August 10, 1969 - Conditionally presented to State of California for display at California State Railroad Museum, by Pacific Coast Chapter, R&LHS.

October 16, 1969 - Trucked to Safeway warehouse in Sacramento for storage.

June 30, 1976 - Moved to reconstructed CP Depot, Old Sacramento, for display.

September 1976 -

June 1979 - Operated several times at CP Depot, Old Sacramento.

September 25, 1976 - Steamed at dedication of CP Depot, Old Sacramento.

April 1978 - Repainted as V&T Genoa (not complete repainting - repair only).

April 21, 1978 - Steamed for groundbreaking at History Building, Old Sacramento.

May 1979 - Steamed for CSRM orientation film, Old Sacramento.

June 19, 1979 - Arrived at CSRM Restoration Shop, SP Yards, Sacramento.

APPENDIX C

COMPONENT ANALYSIS

FOR

RESTORATION OPTIONS

Major Component Changes
 Needed for Historical Restoration Options
 for V. & T. #12

COMPONENT	1873-1878	1902-1908
CAB	Replace	Rebuild
SMOKE STACK	Replace	Replace
PILOT	Replace	Replace
CROSSHEAD PUMPS & INJECTORS	Remove Injectors Add Crosshead Pumps	Use Present Injectors
COUPLERS	Replace	Replace
HEADLIGHT	Replace	Replace
AIR BRAKES	Remove	Reuse
SMOKEBOX FRONT	Reuse	Reuse
BOILER JACKET	Replace	Replace
SAFETY VALVES	Replace	Reuse
FIREBOX DOOR	Reuse	Reuse
CHECK VALVES	Replace One	Reuse
TENDER	Rebuild	Rebuild

COMPONENT ANALYSIS V. & T. #12 (con't.)

	1873-1878	1902-1908	1979
BUILDER'S PLATE	BLW	Date removed, ca. 1902	Original w/ dates soldered on
PILOT BRACES	BLW	- -	- -
FLAG/LAMP HOLDERS	None	- -	- -
CYLINDERS	BLW	- -	- -
LEAD TRUCK	26" Wheels	Rear fender modified, 1902	Front fenders removed, 1938 - all fenders reinstalled, 1939-40
DRIVERS	BLW - tires tapered, 3/16", 2-1/2" thick	Midvale tires, 1901	- -
DRIVER FENDERS	BLW	- -	- -
PILOT BEAM	Wood Poling pockets, ca. '80	Wood Poling pockets replaced	- -
PILOT	Iron rod	Wood stave, 1902	Replacements, 1939 1969
PILOT COUPLER	Unrecessed iron bar and rooster	Tower knuckle	Iron bar & rooster replaced, 1939
CAB	BLW walnut w/ painted name board, replaced ca. 1874 w/ oak & wal.	Number replaces name, pre-1902 - modified, 1906-08	- -
CAB HANDRAILS	BLW	- -	- -
CAB SEATS	BLW	?	?
FIREBOX	BLW	- -	- -
OIL BURNING EQUIPMENT	None	- -	- -
FIREBOX DOOR	BLW	V. & T., 1902 (copy of original)	- -
ASH PANS, GRATES	BLW for wood	- -	Removed, 1910 Replaced, ?

COMPONENT ANALYSIS V. & T. #12

	1873-1878	1902-1908	1979
BOILER	BLW	- -	Stays not drilled
BOILER LAGGING	Felt - later, wood	Magnesia	- -
JACKET	Russia Iron	Russia Iron	- -
JACKET BANDS	BLW - 4 formed brass	- -	3 Replacements Smokebox Band original
SAFETY VALVES	BLW Balance BLW Locking	Consolidated Safety Valve Co. - Size 2	- -
WHISTLE	BLW	- -	1969 Replacement
SANDERS	Gravity Feed	Leach Air Sanders-'08	Brass acorn missing from sand box lid
BELL	BLW - Style 3	- -	Original stolen-'61-3 Replaced 1969
GENERATOR	None	- -	- -
HEADLIGHT	BLW Box	Acetylene 1903	Inappropriate Box
HEADLIGHT PLATFORM	BLW	Modified & raised for '03 Acetylene head- light	
BRASS FLAG FIXTURES	BLW on deck	Connecting grab iron between fixtures added, 1908	Grab iron removed, 1939
SMOKEBOX FRONT	BLW w/ 4 bolts	- -	- -
STACK	BLW Yankee	Sunflower - 1902 Straight, capped-'08	Yankee - 1939 (fake)
HANDRAILS	BLW	- -	Acorns missing from bottom of supports
RUNNING BOARDS	BLW	Notched for air pump	Notch patched, 1969
NUMBER PLATE	BLW	- -	- -

COMPONENT ANALYSIS V. & T. #12 (con't.)

	1873-1878	1902-1908	1979
STEAM GAUGE	Stamp's	Ashcroft, 1902	- -
LUBRICATOR	BLW oilers in cab, Nathan hydrostatic, '89	?	Replacements, 1939
BACKHEAD FITTINGS	BLW	Boiler test plate, 1908-1912	Whistle lever & 1 gaugecock missing
CROSSHEAD PUMPS INJECTORS	2 BLW - Injector on right side, ca. 1885	No pumps 2 Monitor #7 injectors, 1901	- -
CHECK VALVES	2 BLW - Rt. side below sand box replaced for injector, ca. 1885	Lt. side, BLW - Rt. side moved to original location	- -
HAND BRAKES	Tender only - wood or iron brake beams (?)	Wood brake beams (?)	Wood brake beams, pre-1938 (?)
AIR BRAKES	1873 - None 1874 - 6" pump 1892 - 8" pump	1902 - 9-1/2" pump	90% removed & stored by SP, 1969
TENDER UNDERFRAME	BLW	?	?
REAR LIGHT	None	- -	- -
REAR FOOTBOARDS & HANDRAILS	None ?	Tender grab, ca. 1905, Coupler, ca. 1905	Footboards removed, 1939
TENDER FLAG & LAMP HOLDERS	None	- -	- -
TENDER STEPS	BLW	- -	- -
REAR TENDER WRECKING CABLE HOOKS	None; added early	- -	- -
TENDER HANDRAILS	BLW	- -	- -
TENDER TOOL BOXES	BLW	- -	Rear box removed by SP in 1969
TENDER WHEELS & TRUCKS	BLW Trucks, 26" plate Highbridge wheels	Front truck replaced w/ truck from V.&T. #11; Rear, V.&T. replacement (date unk.)	- -
TENDER TANK	BLW	- -	- -
TENDER APRON	BLW	?	Replaced, date unk.

APPENDIX D

PAINT USED IN RESTORATION

PAINTS USED IN RESTORATION OF V&T LOCOMOTIVE #12, "GENOA"

Cab: Fuller-O'Brien exterior wood primer #220-23 (white). Three coats were applied. Base primer was tinted with black, with each coat being darker than the preceding one.

Finish coats were Dunn-Edwards Rancho House and Trim #60-20 (Gloss Black).

Cab interior was primed with the above primer and finished with Fuller-O'Brien gloss enamel #612-32 (Brilliant Green).

Tender Tank: Primer was Dunn-Edwards "Bloc-Rust" zinc chromate/red oxide #43-4.

Finish coat Sherwin Williams gloss black automobile acrylic enamel. The prime and finish coats were applied over a Ditco Ditz Lac surface putty sanded smooth.

Tender Tank Frame: Glidden Spread Gloss, gloss black.

Tender Trucks: Glidden Spread Gloss, gloss black.

APPENDIX D

Truck Wheel Whitewalls: Sign painters "1 Shot" 101-B (white).

Tender Interior: Copon for corrosive control. Primer was activated Copon EA-242 (Red Oxide) with top coat activated Copon, EA-204 (Light Gray).

Pilot: Primed with Fuller-O'Brien wood primer tinted gray, with finish coat Glidden gloss black.

Stack: Glidden Spread gloss black.

Boiler Jacket: To simulate the appearance of the original "Russia Iron" boiler jacket, a special mix was prepared. The 22 gauge galvanized steel metal was given a prime coat of Rust-Oleum Galvenoleum #3202. This was followed by coating of Dupont Dulux automotive metallic charcoal (4980-D) to which had been added Dupont automotive tinting pigment 3-0 (Iron Blue). The mix was 1 quart of iron blue pigment to 4 gallons of the Dulux metallic charcoal.

Cab & Tender Lettering: Letter and numeral faces were 1 Shot #191 (Imitation Gold) with vertical shading 1 Shot #102 (Fire Red) and horizontal shading 1 Shot #108 (Maroon).

APPENDIX D

Miscellaneous:

All other wood parts received Fuller-O'Brien wood primer, while metal parts were Dunn-Edwards metal primed followed by their gloss black.

APPENDIX D

STEAM LOCOMOTIVE SPECIFICATIONSDate: June 14, 1979By: Lee A. Yeager

As Built

Locomotive: V&T 4-4-0 #12 "Genoa"Builder: Baldwin Locomotive WorksBuilder Number: #3090Date Built: 1873Date Ordered: August 5, 1872Gauge: 4' - 8-1/2"Wheel Arrangement: 4-4-0Driver Dia: 56 3/4Type Bearings: FrictionPilot Wheel Dia: 26"Type Bearings: FrictionTrailing Wheel Dia: --Type Bearings: --Type Brakes, engine: NoneDriving Wheel Base: 8' - 0"Maximum Overall Wheel Base: 21' - 9"Weight on Drivers: 45,500 poundsTractive Effort: 11,705 poundsTotal Weight, Engine & Tender: 113,400 poundsCylinder Size: 16 x 24Type Valve Gear: StephensonType Valves: SlideMain Crankpin Size: --Others: --Main Rod Bearing Type: --Side Rod Bearing Type: --Boiler Type: Wagon Top (BLW DWG #235)Boiler Builder Date: 1873Boiler Construction: Crown - Bar

Lap Seam

Superheater: --Number of Tubes: 144Dia: 2"Length: 10' - 10 3/8"Copper Rings
Tube Mat'l: Iron fib. endFirebox Length: 65"Height: 65"Width: 34 1/2"Grate Area: --Fuel: WoodType of Burner: --Number of Safety Valves: 2Type: 1 BLW Balance & 1 BLW LockingLast Date Set: --Pressure Settings: 130 poundsBlowdown Valve Type: --Number of Injectors: NoneType, Left: --Right: --Number Check Valves: 2Type, Left: BLWRight: BLWFeedwater Pump: Crosshead each sideNumber of Water Sightglasses: 1Type of Sightglasses: --Other Water Equipment: --Whistle Type: BalanceLocation: DomeNumber Lubricators: --Types: --Lubricator Location: --

(over)

STEAM LOCOMOTIVE SPECIFICATIONS

(2)

Number of Steam Gauges: 1 Types: StampsNumber of Air Gauges: -- Types: --Number of Cab Lights: 1 Types: OilNumber Headlights: 1 Type of Lights: BLW Box (Oil)Number Back-up Lights: None Type of Lights: Location: Whistle Type: BLW Location: Steam DomeBell Type: No. 3 Bell Dia: 15" Height: Location: Communication/Signal Equipment: Steam Heat Equipment Type: None

Identification Numbers/Markings on Locomotive: (use add'l sheet if req'd)

Tender Type: U-shaped Rectangular Tender Truck Type: 4 wheelNumber of Truck Wheels: 4 Dia. of Wheels: 26" Type Wheels: Plate B.T. HighbridgeType Wheels cont'd: --Type Bearings: Friction Journal Sizes: 3-1/2" dia. x 6" lengthJournal Sizes cont'd: Fuel Cap'y: 3 cords woodTender Weight Empty: Unk. Loaded: Unk. Water Cap'y: 2,200 gallonsTender Wheel Base: 13' - 2"

Identification Numbers/Markings on Tender: (use add'l sheet if req'd)

"8/26 C 33" on right tank side

Obvious Patches/Modifications to Locomotive and/or Tender (other than R.R. Museum Restoration changes/modifications), Explain: (use add'l sheet if req'd)

Notes on specification sheet, "Duplicate of 27 1/2 C 350 except as marked changed".
(This was the number of the V&T engine #11 the "Reno".)

STEAM LOCOMOTIVE SPECIFICATIONSDate: June 14, 1979By: Lee A. Yeager

As Restored (1902)

Locomotive: V&T 4-4-0 #12 "Genoa"Builder: Baldwin Locomotive WorksBuilder Number: #3090Date Built: 1873Date Ordered: August 5, 1872Gauge: 4' - 8 1/2"Wheel Arrangement: 4-4-0Driver Dia: 56 3/4"Type Bearings: FrictionPilot Wheel Dia: 26"Type Bearings: FrictionTrailing Wheel Dia: --Type Bearings: --Type Brakes, engine: Air BrakesDriving Wheel Base: 8' - 0"Maximum Overall Wheel Base: 21' - 9"Weight on Drivers: 45,500 poundsTractive Effort: 11,705 poundsTotal Weight, Engine & Tender: 113,400 poundsCylinder Size: 16 x 24Type Valve Gear: StephensonType Valves: SlideMain Crankpin Size: --Others: --Main Rod Bearing Type: --Side Rod Bearing Type: --Boiler Type: Wagon TopBoiler Builder Date: 1873Boiler Construction: Crown - Bar Lap SeamSuperheater: --Number of Tubes: 144Dia: 2"Length: 10' - 10 3/8"

Copper Rings

Tube Mat'l: Iron fib. endFirebox Length: 65"Height: 65"Width: 34 1/2"Grate Area: --Fuel: WoodType of Burner: --Number of Safety Valves: 2Type: 1 BLW Balance & 1 BLW LockingLast Date Set: Aug. 1980Pressure Settings: 80-85Blowdown Valve Type: PlugNumber of Injectors: 2Type, Left: Nathan - MonitorRight: Nathan - MonitorNumber Check Valves: 2Type, Left: BLWRight: BLWFeedwater Pump: NoneNumber of Water Sightglasses: 1Type of Sightglasses: Glass TubeOther Water Equipment: Gage CocksThrottle Type: BalancedLocation: Steam DomeNumber Lubricators: 2Types: HydrostaticLubricator Locations: Cab

(over)

STEAM LOCOMOTIVE SPECIFICATIONS

(2)

Number of Steam Gauges: 1 Types: D able Spring Locomotive
Number of Air Gauges: 1 Types: Compound
Number of Cab Lights: 1 Types: Oil
Number Headlights: 1 Type of Lights: Oil
Number Back-up Lights: -- Type of Lights: -- Location: --
Whistle Type: Steam - Single Chamber Location: Steam Dome
Bell Type: BLW (Reproduction) Bell Dia: 15" Height: Location:
Communication/Signal Equipment: None
Steam Heat Equipment Type: None
Identification Numbers/Markings on Locomotive: (use add'l sheet if req'd)

Tender Type: U-Shaped Rectangular 8 Wheel Tender Truck Type: Baldwin
Number of Truck Wheels: 4 Dia. of Wheels: 26" Type Wheels: Chilled Cast Iron
Type Wheels cont'd:
Type Bearings: Friction Journal Sizes: 3 1/2" Dia. x 6" Length
Journal Sizes cont'd: Fuel Cap'y:
Tender Weight Empty: Unk. Loaded: Unk. Water Cap'y: 2,200 Gallons
Tender Wheel Base: 13' - 2"
Identification Numbers/Markings on Tender: (use add'l sheet if req'd)

8/26 C 33 on right tank side.

Front trucks: front frame cross member, hand cut "FT"

rear frame cross member stamped "27 1/2 C 350"

(this is Baldwin construction number for V&T No. 11 "Reno")

Obvious Patches/Modifications to Locomotive and/or Tender (other than R.R. Museum Restoration changes/modifications), Explain: (use add'l sheet if req'd)

Note on specification sheet, "Duplicate of 27 1/2 C 350 except as marked changed".

FOOTNOTES

1. For more detail on research methods used by the CSRM research staff, see: Sharon L. Edaburn, "The Monterey & Salinas Valley Railroad: Combination Car No. 1", p. 47. (CSRM report, 1978)
2. See other CSRM Reports; also, unpublished paint correlations on V&T 18, Dayton, prepared by R. G. Steiner, former CSRM staff member, for Nevada State Railroad Museum, 1979.
3. Richard N. Katz, "The North Pacific Coast Railroad: Locomotive #12, 'Sonoma'," (CSRM Report, 1979) p. 13.
4. Territorial Enterprise, November 3, 1874.
5. Ibid.
6. See Appendix A for analysis of "silver" paint sample.

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Paint Research Technique

Hartshorne

Technical leaflet 15

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P H O T O G R A P H S

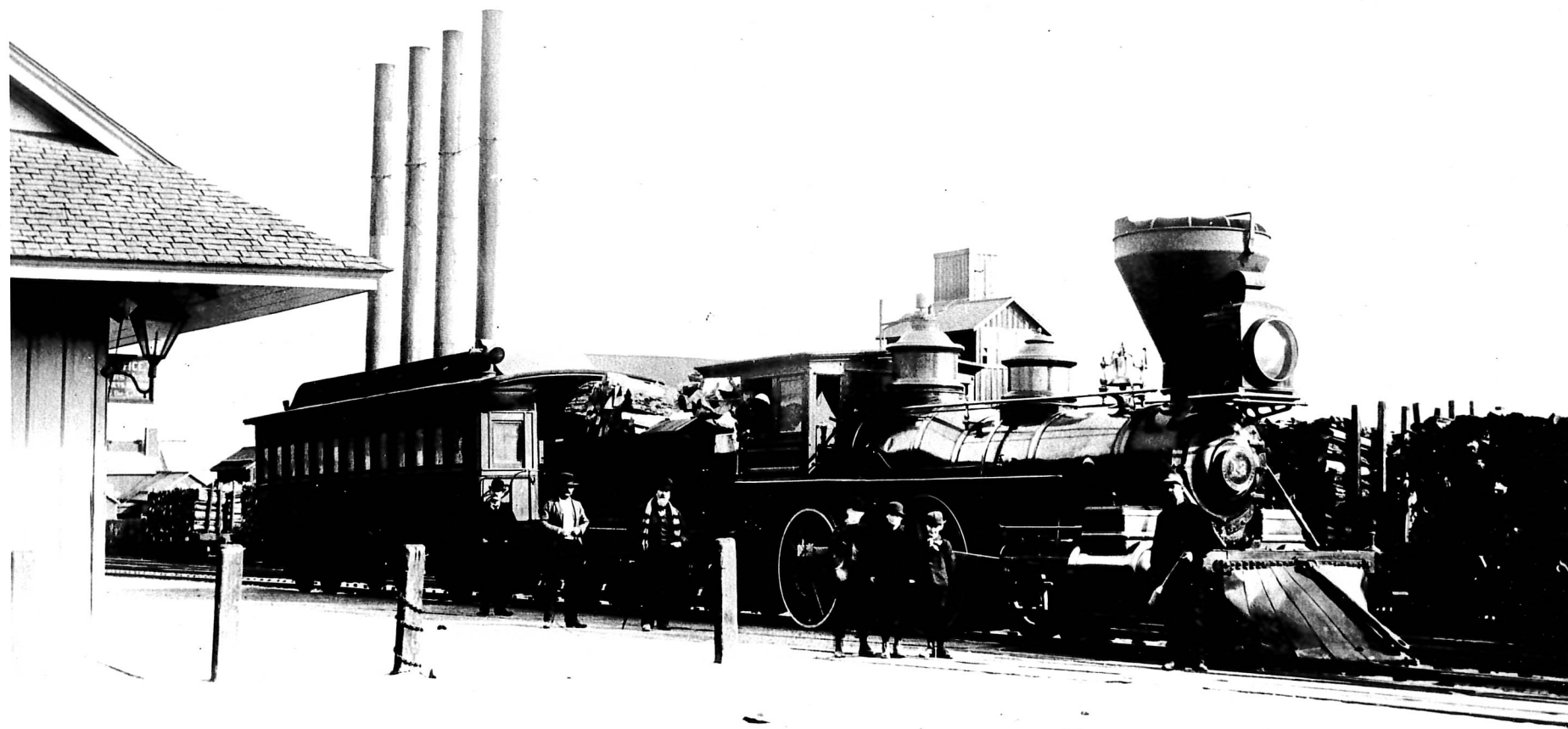


Photo #1

Virginia & Truckee Locomotive No. 12 "Genoa," in Virginia City, Nevada, circa 1890.
(Gilbert H. Kneiss Collection)

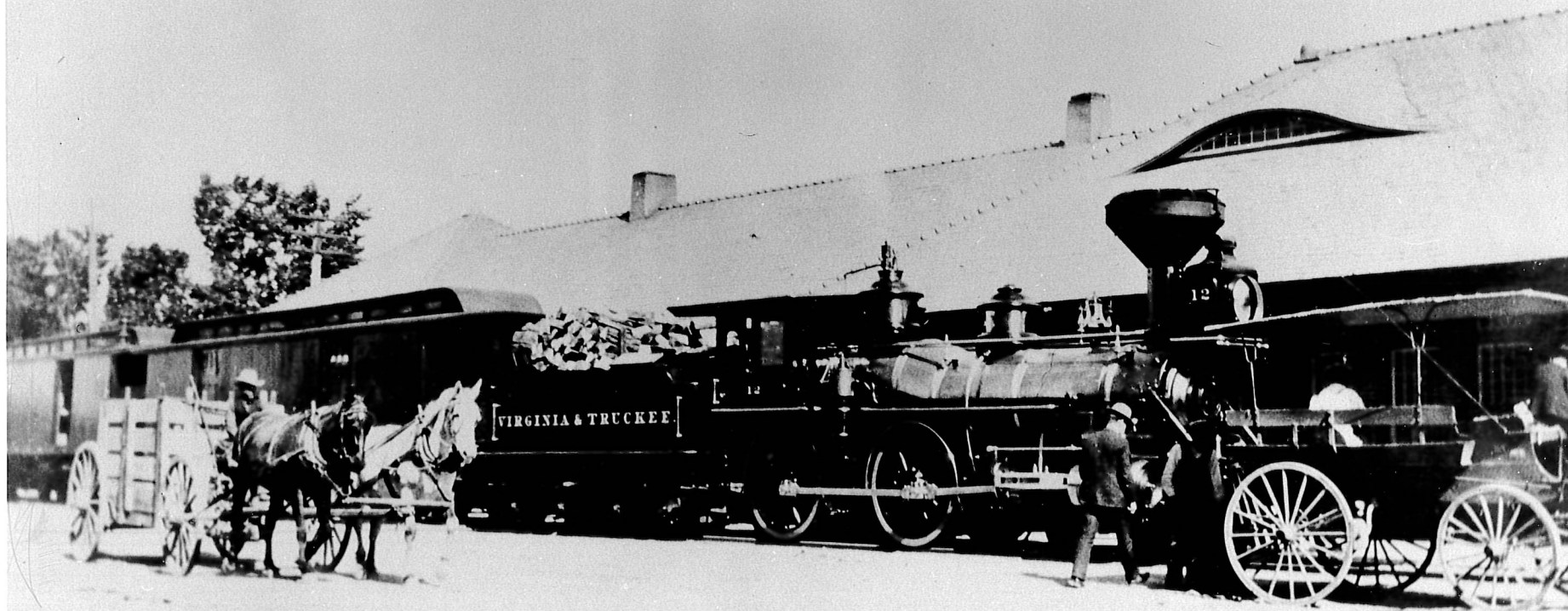


Photo #2

The "Genoa" pulling into the Reno depot circa 1902.
(Stephen E. Drew Collection)

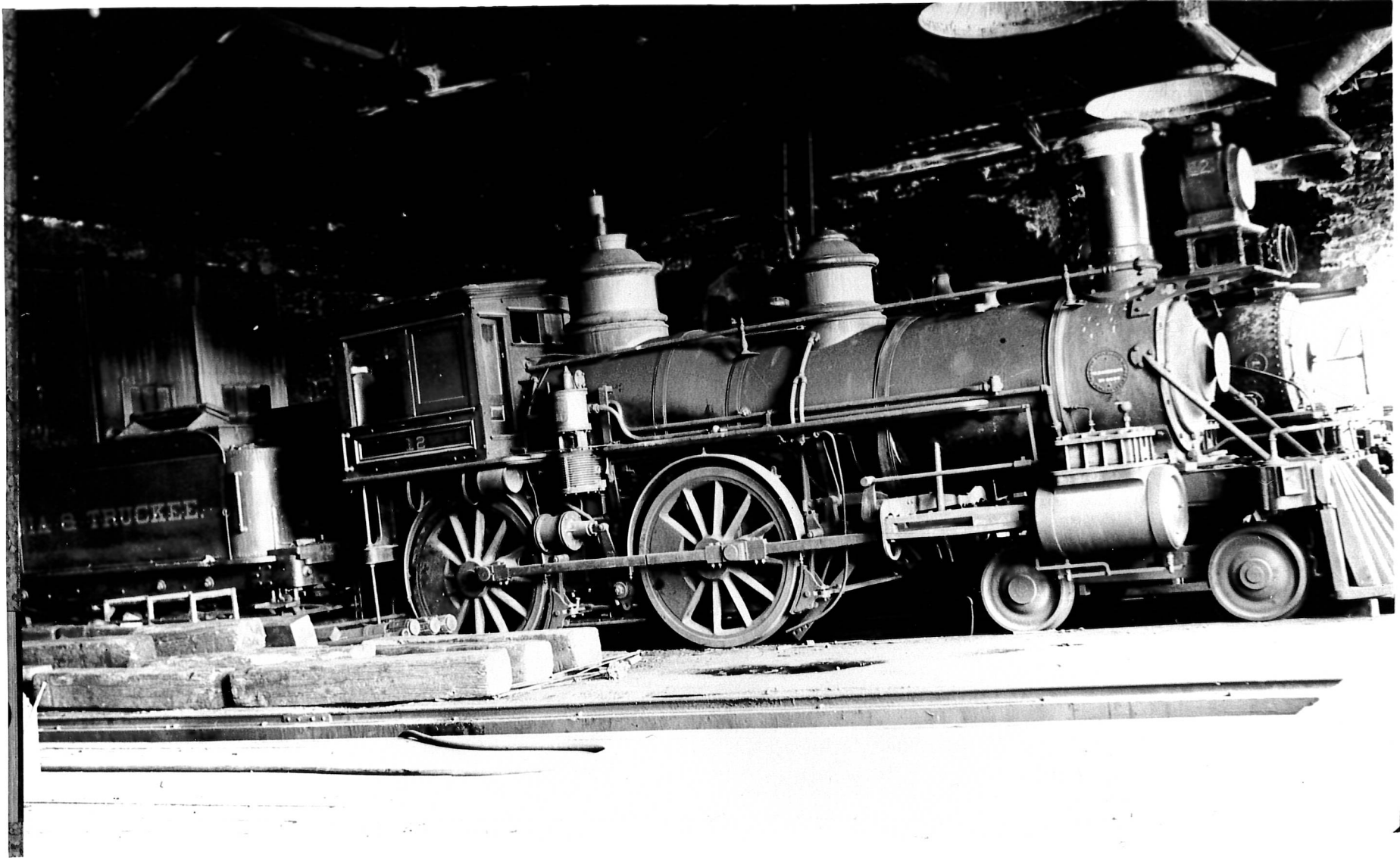


Photo #3

The "Genoa" stored in the Carson City, Nevada, engine house, June 5, 1938.
(Guy L. Dunscomb photo)

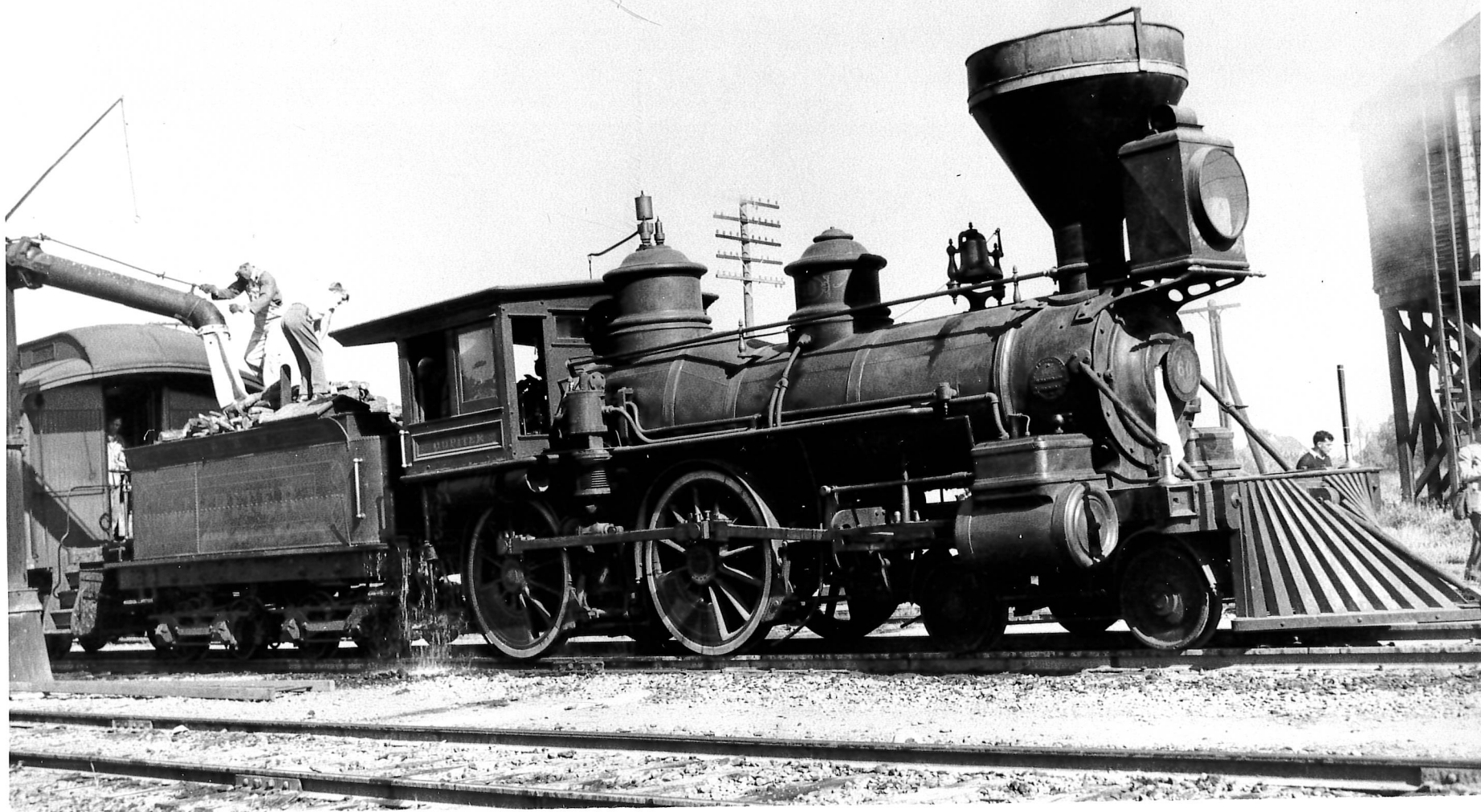


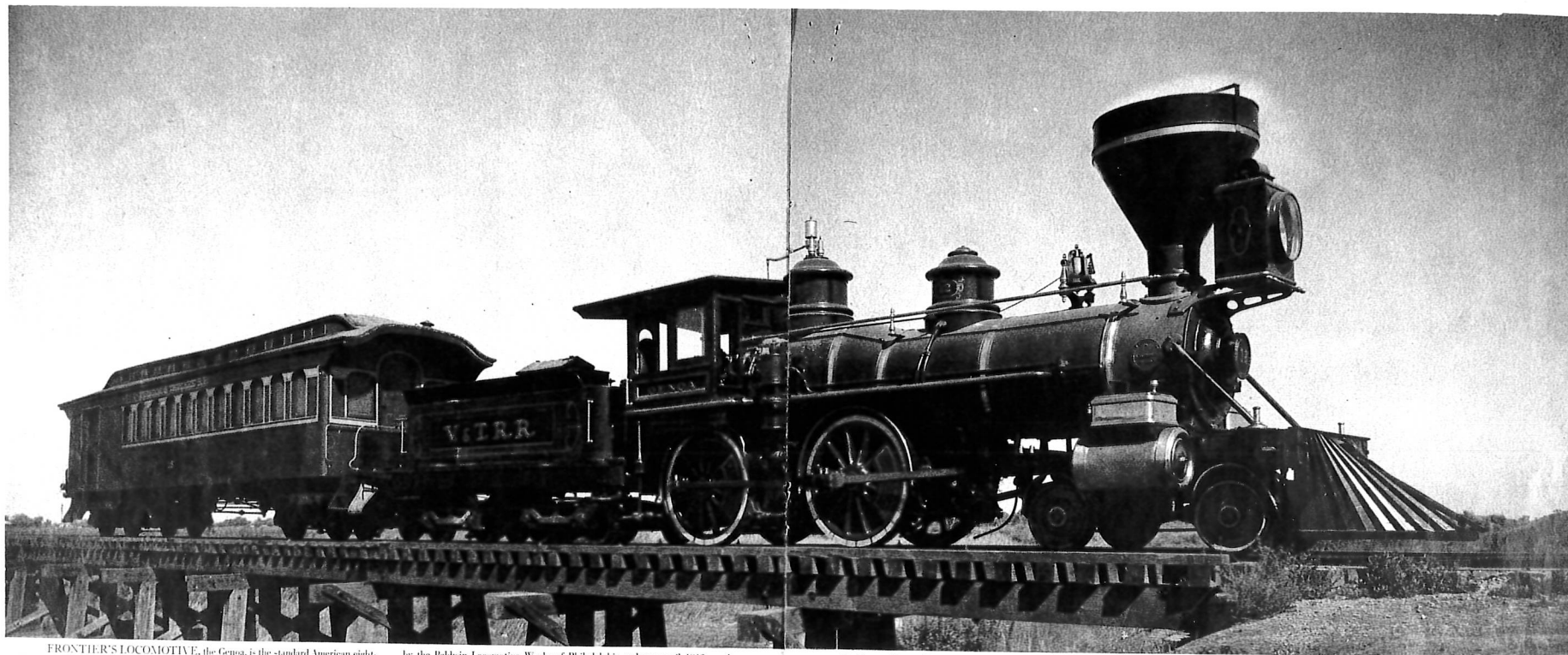
Photo #4

The "Genoa" taking on water on an Oakland-San Jose run, May 1, 1949. The locomotive had been repainted to represent Central Pacific's "Jupiter."
(Fred A. Stindt photo)



Photo #5

The "Genoa" in Sacramento, August 21, 1955. (Douglas S. Richter photo from the Guy L. Dunscomb Collection)



FRONTIER'S LOCOMOTIVE, the Genoa, is the standard American eight-wheeled type used everywhere in the early West. This engine was built in 1872

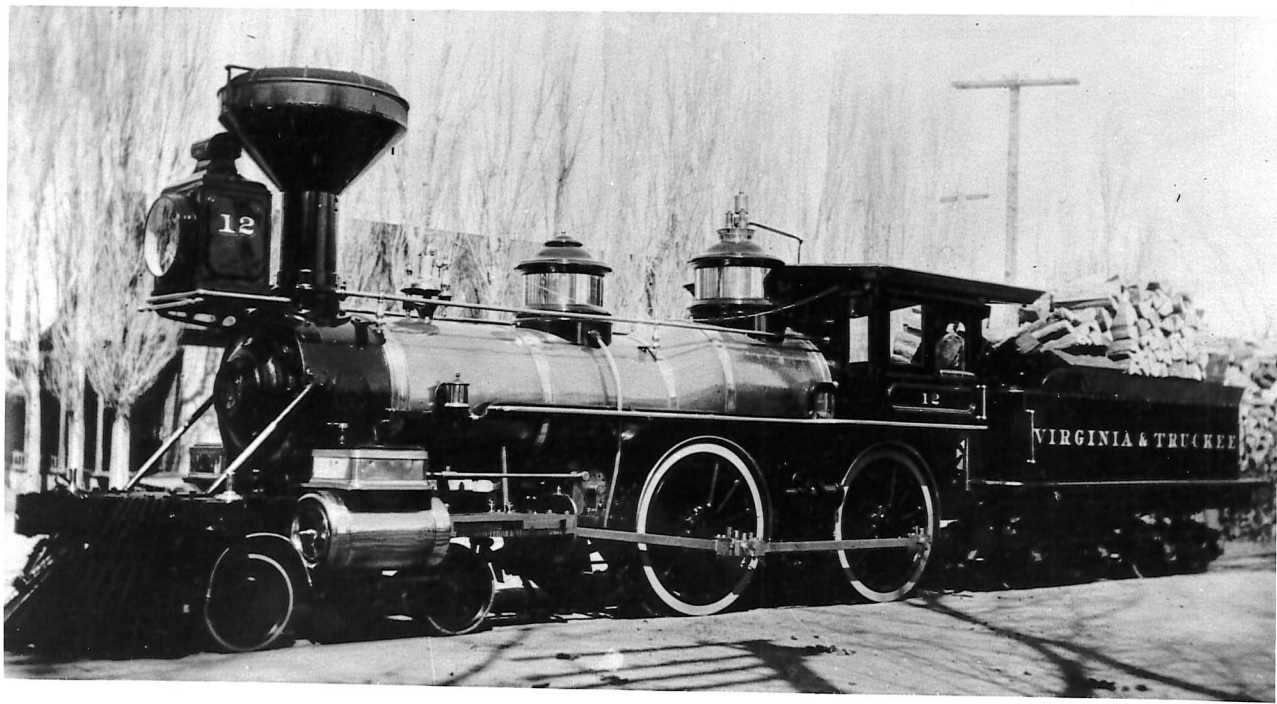
by the Baldwin Locomotive Works of Philadelphia and ran until 1912 on the mountainous Virginia & Truckee line which linked silver-rich Virginia City, Nev.

with Carson City and Reno. The towering funnel in front is a spark arrester, designed to reduce the danger of fires along the right-of-way. Other distinctive

American features are the wooden cowcatcher, kerosene-burning headlight and bronze bell, all needed on American roads to clear and inspect the right-of-way.

Photo #6

The "Genoa" with combination car No. 16, photographed August 31, 1955, on Stockton, Terminal & Eastern, at Stockton, California. (Life magazine photo)



V. & T. #12 Carson, Nev. ca.

M. North collection / Beebe copy print
CSRM copy neg. available

CALIFORNIA STATE
RAILROAD MUSEUM

Virginia & Truckee Locomotive No 12 "GENOA" passing workmen
near Minden, Nev. Collection Univ. of Nev.-Reno
Special Collections Library